ORIGINAL PAPERS..

On the Dress of the Army of India.

By COMMON SENSE.

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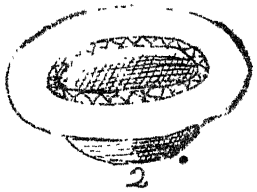
In consequence of the authorities having invited Officers to write an essay on the dress of all branches of the Indian Army,—European and Native,—I presume they are anxious to have this important subject thoroughly ventilated by those whose practical experience renders them capable of forming a sound opinion on this knotty and much-vexed question, concerning which pseudo-reformers have at various times written so much sense and nonsense. Fearing that the remarks which I am about to make may be fated to be classified in the latter category, I address myself to the task with extreme diffidence, as I cannot help feeling that probably many better Soldiers than myself are at present similarly engaged; so I shall commence by assuring those who kindly take the trouble of wading through the following pages, that my sole object in entering the arena in this discussion is in the hope that some of my ideas may prove worthy of consideration, and I shall be perfectly satisfied if even one of the many suggestions I am about to make is eventually adopted, as I shall then have the pleasure of feeling that I have, to this trifling extent, aided those who are endeavoring to promote the welfare of a noble service in which I have passed the best years of my life. As I believe every one will admit that the Infantry is the backbone of the Army, I shall commence by discussing the dress of the Foot Soldier and shall begin with his head-dress.

HEAD-DRESS.

I strongly disapprove of the present wicker helmet issued to troops serving in India for many reasons, some of which I shall now proceed to enumerate. It is most unnecessarily large, and projects so far over the eyes and nose that it materially interferes with a man's shooting, and, I think, this alone is sufficient to condemn it, as a head-dress, in which a Soldier cannot take accurate aim, is of course most undesirable. It is a most inefficient head-dress in wet weather, and the cane work is an excellent hiding place for bugs, which swarm in most of the barracks in India. It is most uncomfortable to wear, and I do not consider it to be a very good protection against the sun. It is easily put out of shape, and is even, when new, extremely unsightly in appearance: I would suggest that a grey felt hat, of the stoutest description, of the shape of



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that depicted roughly (*vide Fig. 1*) be substituted in lieu of the wicker helmet, as I conceive that it would be an immeasurably more comfortable and efficient head-dress, and would be equally suitable for all countries and seasons; for with the addition of a wadded linen cover and large turban (*Fig. 2*), I can assert, from personal experience, that it is rendered impervious to the vertical rays of the most powerful tropical sun, as I never wore any other kind when out in pursuit of large game during the exceptionally hot weather we experienced last May and June. The hat I propose should be tolerably high in the crown, and should be ventilated on Ellwood's principle (*Fig. 3*).

Should the authorities consider that the back of a man's head and his temples would not be sufficiently protected from the sun, when wearing a perfectly comfortable hat such as I have endeavoured to describe

I would, in that case, recommend that a strong grey felt helmet be adopted in lieu of the wicker one, and of such dimensions as not to interfere with a man's eyesight, which the present pattern certainly does, as any one will be able to testify, who has seen troops wearing them when at ball practice. I think the shape of the cork helmets supplied by Hawkes and Co., is the best I have seen, as they are not nearly so clumsy as the wicker ones, and are soldier-like in appearance; but, in my opinion, no helmet is as comfortable as a hat shaped like the one I have recommended for adoption.

FORAGE CAPS.

As Forage caps should only be worn by troops serving in India either early in the morning or late in the afternoon, I think the Glengarry cap, which has, I believe, recently been decided on for the use of the Infantry, is as sensible a one as could be devised, as it is soldier-like in appearance, extremely comfortable, portable and not liable to get out of shape, whereas the Kilmarnock cap, at present in wear possess none of these qualifications.

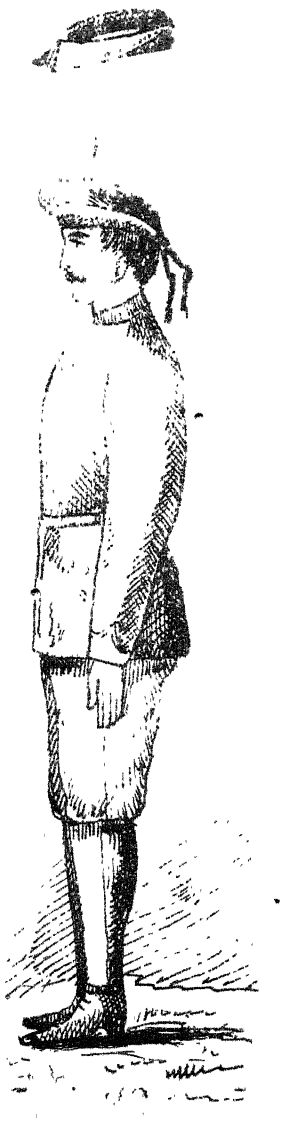
TUNIC.

I disapprove entirely of the present tunic, as I consider it to be badly adapted for active service, either in Europe or India: it is far too tight and interferes seriously with the respiratory organs, as the throat and chest are far too confined.

Although I fully recognize the necessity of making the dress of the Soldier as showy and attractive as possible, especially in an army raised by voluntary enlistment, nevertheless as England maintains, a standing army for the purpose of upholding her honor in all parts of the world, and not for attracting the admiring gaze of her fair daughters when witnessing a mimic warfare at Aldershott, and such like places when; devising a suitable dress for the Army, perfect freedom to the limbs, comfort and serviceableness should be the first considerations; and if it is impossible to hit upon a really handsome uniform possessing these essential qualities which I am rather inclined to think will be the case, then the only business-like way what I can see of solving the difficulty is for the soldier to have two coats, one for show, and the other for work, and I think this might be managed without increasing the cost of clothing the Army to any great extent, as I shall endeavour subsequently to explain.

THE NORFOLK JACKET TO BE THE WORKING DRESS.

In my humble opinion, the proper working dress for the British Soldier would be a stout scarlet serge Norfolk jacket, with a small rolling collar; for I am a great advocate for having the neck left perfectly free from pressure, which is certainly not the case at present in any of the coats now in wear. For, although the ridiculous leather stock no longer exists in the Army as a remnant of barbarism, nevertheless, until the present stand-up collar, fastened by a hook and eye of huge



dimensions, is swept away, the necessary freedom will not be attained: besides being uncomfortable the stand-up collar is most uncleanly, as every one who has had much to do with Soldiers must have frequently observed how often the inside of the collar of a Soldier's tunic appears saturated with grease from perspiration, whereas a coat with a small rolling collar, such as I have endeavoured to sketch *vide Fig.* 4, would be free from all these objections; and as it would, of course, be most unsightly to see the neck band of a not over-clean shirt protruding above the rolling collar, I would prevent such an exhibition by causing Soldiers to supply themselves with two or three blue cotton moveable collars to fasten round the neck, as do the white ones most of us now wear when in plain clothes. The shape of a Norfolk jacket is so generally known, owing to its having now for some years held a high place in the

estimation of sportsmen as a dress admirably adapted for those whose pursuits demand great physical exertion, that I think it would be superfluous for me to give a minute description of it here; so suffice it to say that the Norfolk jacket should be the working dress of the army; and I would suggest that a stout scarlet serge Norfolk jacket be issued annually to troops serving in India, in lieu of the cloth tunic, which is an unsuitable dress at any time or season for Soldiers serving in any tropical climate.

SHELL JACKET.

Although it does not, perhaps, come within my province as an essayist on the most suitable dress for the Army in India to touch upon the shell jacket, as that ridiculous and thoroughly-unserviceable garment does not form part of the kit of the Infantry Soldier in this country, nevertheless, as I am most anxious to see its abolition as an article of dress for the British Soldier when serving in other countries than India, I cannot refrain from embracing this opportunity of condemning it; as, I think, it must have struck most observing individuals when they have met Soldiers buttoned up in tight shell jackets, when employed as working parties or in carrying coal or other fatigue duties, how singularly ill adapted such a dress is for the purpose. I calculate that a Soldier serving out of India could procure a scarlet serge Norfolk jacket, such as I propose should be issued to Soldiers serving in India in lieu of the cloth tunic, for, if anything, less money than he now pays for the shell jacket; therefore, if the cloth tunic, modified as I shall hereafter explain, was issued to him for show, he would not be put to greater expense than he is at present, should he be compelled to pay for the Norfolk jacket, as he would merely have to purchase it in lieu of the shell jacket.

BLUE WOVEN JERSEY SHIRT.

I think that a blue woven woollen Jersey, such as is now worn by all Sailors, should form part of the kit of British Soldiers of all Arms. as it is admirably adapted as a working dress for Soldiers when performing any kind of fatigue duty, or recruit or sitting up drill in the barrack square, and would be equally well suited for men employed in throwing up field works; and it would prove a most economical dress, as a good woollen Jersey would last for years; and in cold weather the men could wear it underneath the Norfolk Jacket. And should the Government demur at the expense which the gratituous supply of the extra article biennially would necessitate, I do not think it would be any great hardship to the Soldier should he be obliged to furnish himself with one at his own expense, as Soldiers are now so much better paid than they used to be.

FULL-DRESS TUNIC NOT TO BE TAKEN ON ACTIVE SERVICE.

If a Soldier possessed a Sailor's Jersey to wear when employed on fatigue duty or underneath the Norfolk jacket in cold weather, it would obviate the necessity of his taking a tunic on active service; for as I have before stated, I consider that the tunic should merely be worn when on Home service, or when a Regiment was employed on ordinary garrison

duty in some non-tropical climate. As I may not have occasion to allude to the tunic again in the course of a treatise on the Dress of the Army, I might as well state that I consider this tunic, cut somewhat the same as the blue patrol jacket now worn by the Officers, would be far preferable to the present tight-waisted one; and, in order to give it a showy appearance, I would have it braided with yellow cord up the back and across the chest and fastened with hooks and eyes, and frogs and olivets, instead of the present enormous sized brass buttons *(vide Fig.* 5).



WHITE CLOTHING.

I strongly disapprove of the coarse American drill white clothing; for, although cool in appearance, it is, in my opinion, by no means so in reality; for, being of close texture, it only requires the addition of the congee water, usually so liberally bestowed on it by the *dhobies* (in lieu of starch), to render it almost impervious to air, to say nothing of the disadvantage of so many suits being required to enable a Soldier to turn out on all parades, and other occasions, in a cleanly state. I would substitute in lieu of the four suits of white clothing, which Soldiers serving in India have now to keep up at their own expense, two suits of thin serge, as, having worn clothes of that description myself, I can speak in the highest terms of its durability, and it is undoubtedly far cooler than white drill for being of such open texture the air circulates freely through it, and when I have become heated I have never experienced the chills I have felt sometimes when wearing white clothing. As dark blue or scarlet is considered to attract the rays of the sun more than a lighter colour, I would suggest light French gray as a suitable colour, if a fast dye of that colour is procurable; in fact, somewhat the same shade as that worn by the old Bombay Light Cavalry. The cut of the coats of this light serge should be the same as that of the scarlet serge, which I have proposed as the working dress, *viz.*, a Norfolk jacket; and if the authorities considered that it required some embellishment, I would suggest a little red piping round the wrist-bands and small rolling collar, which would have a pleasing contrast with bluish gray. The Soldier serving in India would have to keep up two Norfolk jackets, and two pairs of trowsers of

this light serge, in lieu of the white clothing; and as I propose that Soldiers serving in India should receive annually a scarlet serge Norfolk jacket, and no tunic, the difference in the Soldier's favour between the cost of the latter and that of the former garment should be applied towards paying for the two serge suits which I calculate a Soldier would require annually, the balance requisite to cover the total cost of these two light serge suits to be stopped from his pay.

WAISTBELTS NOT TO BE WORN OFF DUTY.

As a Norfolk jacket always sits close to the waist owing to the band round it, I think the rule at present in force of compelling Soldiers to wear the uncomfortable hard buff leather waistbelt might be rescinded with advantage when Soldiers are off parade or duty, as it would not only conduce immensely to their comfort, but would deprive them of an offensive weapon, with which serious injuries have often been inflicted by men engaged in drunken brawls.

SUMMARY OF THE ALTERATIONS PROPOSED IN THE COATS OF THE INFANTRY SOLDIER.

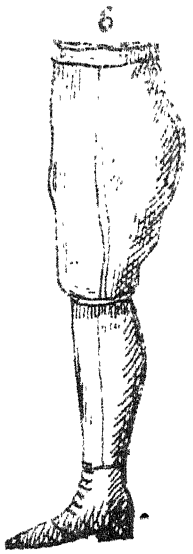
As I have written so long a paragraph on the coat question, perhaps it would be as well for me to here summarize the alterations I propose, *viz.*, the tunic to be cut like an Officer's patrol jacket (which, I am sure most of my brother Officers will agree with me in saying, is the most comfortable dress that has ever been devised for us, and it only requires a rolling collar, such as that worn by Engineer Officers, to render it perfect). The abolition of the shell jacket for Soldiers serving at Home, and the substitution of a stout scarlet serge Norfolk jacket, which should be served out annually to Soldiers serving in India, instead of the tunic, which should not be worn by Soldiers serving in a tropical climate.

A Sailor's woollen woven Jersey to form part of the kit of all Soldiers.

Two suits of light textured gray serge to be kept by Soldiers serving in India in lieu of white clothing.

BLACK CLOTH TROWSERS.

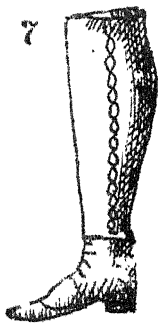
I consider the black cloth trowsers to be the worst article at present issued to the British Soldier: they are far too coarse in quality; the consequence is, that if a man wears them on a long march along a wet and muddy road, as soon as they get wet and dirty about the legs they are sure to drag, and will, in all probability, gall him about the thighs; in fact, I think that the black cloth trowsers at present issued are totally unfit for the Infantry Soldier, whom I would supply with a modified knickerbocker made of the blue serge; that is to say, I would have the thighs made on the knickerbocker principle, only not quite so baggy as those usually worn by sportsmen; and from where the band below the



knee is placed. I would attach leggings of the same material; so the knickerbockers and leggings would form one garment, which, I think, would be desirable, as a Soldier would be able to put them on more expeditiously than if they were separate; in fact, the trowsers I propose are a species of pantaloon fitting perfectly loose about the thighs and knees, and tight from below the knee to the ankle; the legging portion to be fastened by small flat buttons concealed by a flap in the same way as the front of an ordinary trowser is secured (*vide Fig.* 6). I think the Soldier would require two pairs of these pantaloons, the second pair to be of the same colored serge, of a lighter texture for summer wear.

LEATHER LEGGINGS.

I am sure that any man who has taken a walking tour, carrying his own knapsack, will bear me out in saying that a well-fitting legging is an immense support to the leg; and I think, the leather one worn by the Zouaves and Voltigeurs of the French Army is as good a one as could be devised (*Fig.* 7); therefore I think, leather leggings of that description should be served out to our Infantry, and that they should be invariably worn over the pantaloons on the line of march, and on all occasions during wet or cold weather. I opine that any one who recollects what slovenly dirty fellows English Soldiers looked in the Crimea when returning from the trenches with their wide-legged trowsers begrimed with mud and filth up to their knees, cannot fail to endorse the opinions I have expressed as to the proper style of leg clothing for Foot Soldiers. The legging should be sufficiently long to cover the top of the boot, which all-important part of the Soldier's equipment I shall now proceed to discuss. When I first joined the service, now more than 22 years ago, I think there is very little doubt but that the British Army was the worst booted in Europe; as little or no regard was paid to the proper fitting of the man's boots, and as they only received one pair of badly-shaped ill-made, ammunition boots in the year, they were compelled to provide themselves with at least one other pair; and as in those days little or no attention



was paid to these matters, the men frequently had in their possession high-heeled, narrow-toed boots in which no man could march; the consequence was that whenever the men had a long march, numbers fell out foot-sore; and having read of the extraordinary marches occasionally performed by British Soldiers in the Peninsula, I was somewhat astonished, when as a lad of 17½ I took my first march with a company of a distinguished Corps (in fact *nullis secundus*) to find that before we had proceeded ten miles several of the men were sitting down by the side of the road utterly incapacitated to continue the march, owing to their ridiculous high-heeled dandified boots having blistered their feet.

BOOTS.

Although within the last few years the shape and quality of the ammunition boots have vastly improved, nevertheless I do not consider the present boot to be anything like as serviceable a one as might be adopted; for, in the matter of boots, appearances should be banished from all consideration, as an Infantry Soldier who cannot march is useless; and to enable him to do so, it is essential that he should wear the style of boots which game-keepers and sportsmen have pronounced to be the best after long experience, so I should recommend that a leaf be taken out of their book *in re* of boots.

Being myself an enthusiastic sportsman, and a tolerably good pedestrian, I have no hesitation in condemning the ammunition boot, radiant from the joint effects of Day and Martin's blacking and elbow grease, and think it should give place to a broad and tunnelled-soled boot. I mean by the expression that the sole should project considerably beyond the uppers, the toes should be broad and capped, the heels should be low, broad, and long, the uppers should lace tolerably high up so as to ensure the legging well lapping over them, thus preventing gravel or sand getting down the boot, which is a frequent cause of men becoming footsore (*vide* Fig. 8). I should not be in favor of too heavy a boot,





therefore I should not stud the sole too thickly with nails: but I would recommend screws, slightly projecting above the surface of the sole, being placed as shown in (Fig. 8). as they would sufficiently protect the sole and would prevent the men from slipping when marching along a greasy muddy road, the lower portion of the boot to be fastened with brass bound eyelet holes, sufficiently large to admit of the strongest fishing line boot laces, which is a material at least double as thick as the stoutest whip cord, and I have found it far more durable than leather, as the latter, unless of the best porpoise hide, which is very hard to

procure, are very apt to break. The upper portion of the boot might be fastened by hooks, as a boot secured in this manner is much more quickly laced than when the lace for the whole length has to be passed through eyelet holes. Blacking and a polishing brush should not form part of the kit of the Foot Soldier, as his boots should be invariably kept well greased as a man cannot march in hard boots. Before concluding the subject of boots, I would wish most strongly to urge the absolute necessity of more attention being insisted on, on the part of Regimental Quarter Masters, Officers Commanding Companies, and their Pay Sergeants, respecting the proper fitting of the men's boots. Every man's foot in the Regiment should be carefully measured annually by one of the Regimental Boot-makers, and the size carefully noted in a roll book, so that the most accurate information could be supplied to the Quarter Master when making out his requisition for boots; as I think as much care as there ought to be is not bestowed on this most important matter at present, consequently it is by no means rare to see a Soldier wearing badly-fitting boots. Any men with peculiar shaped feet, whom it would be impossible to fit from the stock of different size boots supplied by the Clothing Department, should have their boots made in the Regimental Workshop, which establishment should be supplied by Government with every description of last.

The long boots issued in the Crimea were absurdities for Foot Soldiers, as the men were utterly unable either to march or work in them. A good lace boot is the only description worthy of a moment's consideration for a Foot Soldier.

GREAT COAT.

I shall now discuss the great coat. I consider the one issued from the Clothing Department to be very inferior in quality to the light blue cloth great coats supplied by the Bombay Government. I have only seen one of the new pattern English great coats, and I certainly did not approve of it, as the cape was sewn down, which is most objectionable for India; as, being a bug-infested country, coats of this cut would speedily be well-tenanted by those troublesome insects, as it would be impossible to clean a coat of this description. I think a cloth cape is a mistake for a Soldier's great coat. I would merely have a rolling collar, which could be turned up in very bad weather, and I would have buttoned on to the coat a cloth hood similar to that worn in the French Army, as I often noticed in the Crimea that French sentries looked far more comfortable in bad weather with their hoods than our men did with a useless cape blowing about. In lieu of the cloth cape I would supply each Soldier with an oblong shaped piece of tarpaulin or oiled light canvas, such as Soldiers' great coats are made of; along the sides of which I would place eyelet holes, and, I think, it could then, by a little arrangement, be applied to the following purposes, *viz.*, 1*st*, as a cape to be worn in wet weather; 2*nd*, as a waterproof sheet for the Soldier to lie on at night; 3*rd*, two or three fastened together might from a *tente d'abri*, such as the French use; 4*th*, on the line of march his blanket and great coat might be rolled up in it, in such a manner as,

with the addition of slings on the yoke principle, to form a knapsack; as the following articles of kit could be placed in a small brown Holland bag which would be packed in the waterproof together with the blanket and coat, thus keeping the whole of the Soldier's kit perfectly dry, *viz.*, one flannel shirt, one pair of woollen socks, one pair of pantaloons, one pair of boots, and one Sailor's Jersey shirt, one towel, and a knife, fork and spoon; and these articles, with the addition of the mess tin, which should be strapped to the slings, is the kit which I consider he should carry on his back on service, as he should never be dependent on the agency of transport for a complete change of clothes; for although I have observed that some Military writers suggest that the Foot Soldier should not be hampered with anything to carry except his rifle and ammunition, I cannot endorse such an utterly fallacious theory; and have always concluded that these impracticable suggestions must have emanated from men who had had no practical experience of actual warfare, and were consequently advancing absurd theories on a subject which they were thoroughly incompetent to discuss. As all real Soldiers know the difficulty of procuring a sufficient amount of transport for the conveyance of the spare ammunition, food and sick of an Army, therefore they would not be at all likely to advocate that the British Infantry Soldier should henceforward have the kit conveyed for him, which he and every other Foot Soldier in Europe has, up to the present time, carried on his back. I do not think it at all follows as a natural sequence that because the British Soldier, when buttoned up in a tight-fitting tunic, has proved himself unable to carry a most unnecessarily large kit packed in the worst possible description of knapsack, that, when dressed in the workman-like costume I propose, he should be unequal to carry the articles I have named; all of which, I think, must be pronounced essentially necessary to his health and comfort on a campaign.

UNDER CLOTHING.

As too much attention cannot possibly be bestowed on anything calculated to promote cleanliness in the British Soldier, as the preservation of his health, I feel convinced, depends nearly as much on it as on his being properly clothed and fed, I am strongly in favour of a couple of pairs of cotton web drawers forming part of the kit of British Soldiers of all Arms, as, I think, the present system of allowing them to wear trowsers (of material incapable of being frequently washed) without drawers is a mistake, and one likely to prove prejudicial to the health of the men, as very little consideration must suffice to convince the most sceptical on this point that with men of dirty habits their trowsers must frequently be in an extremely filthy state. When Soldiers are starting on a campaign in a cold climate, they should be supplied with drawers of a woollen web.

SHIRTS AND SOCKS.

The Soldier on a campaign or when on the line of march should be compelled to wear a flannel shirt and wollen socks; therefore, two of the

former and two pair of the latter should invariably form a portion of his kit, so that he should at all times be prepared for either of these eventualities; but when in quarters I should recommend his being allowed to wear cotton shirts and socks, if he preferred so doing. I think I have now pretty will exhausted my ideas regarding the dress of the Infanty Soldier, so I shall proceed to discuss that of the Dragoon.

BRITISH CAVALRY.

Most of my remarks regarding head-dress, coats, and under-clothing for Infantry, are equally applicable to Cavalry Soldiers, as I would likewise advocate their having a handsome tunic for show, and a good sensible working dress for service; and for the latter purpose I should say that there could be no better one than a short-skirted stout serge Norfolk jacket; for, although I do not pretend to be a sabreur, I think it stands to reason that a Dragoon could wield a sword with more effect when clothed in a perfectly loose dress than when buttoned up in a tight tunic. And it strikes me forcibly that if a plated or bronzed steel curb-chain was placed instead of shoulder straps on the Norfolk jacket, that many a man would in action be protected from what otherwise might prove a fatal cut. But being a Foot Soldier I advance this opinion with all humility. I cannot think that the present leather-bound over-all can be as comfortable as a tolerably tight-fitting pantaloon, such as many of us wear in the hunting field; and I consider that a Hessian boot with a heel like an ordinary top boot, (*viz.*, long and low) and hunting spurs, would be more business-like than the high-heeled Wellington boot with screw or box spur. The Cavalry man would, of course, require a light pair of ankle boots or shoes for wearing when at stables, or employed on fatigue duties. But I cannot help thinking that the Hessian boot, or at any rate a boot somewhat of that description, is the most comfortable for the mounted man.

ARTILLERY.

My remarks regarding the advantages likely to accrue from a loose dress being supplied to the Cavalry and Infantry soldier, applies with still greater force to the Artillery man, as the duties which he is frequently called upon to perform demand a greater amount of physical exertion; therefore it is a matter of the first importance that his muscular action should not be impeded by his limbs being encased in tight clothes, and as the modifications necessary to render the costume I have proposed for the Infantry Soldier applicable for the British Gunner is not likely to be well treated by me, I conceive that the subject had better be ventilated by an Officer belonging to that Arm of the Service.

DRESS OF NATIVE TROOPS—CAVALRY.

I think that the loose Norfolk jacket and the pantaloons and Hessian boots and hunting spurs I have proposed for English Cavalry would prove an equally suitable dress for the Native Cavalry; but there is no doubt that many of the Irregular Regiments wear a very workmanlike costume, and if any alterations are desirable, any of those gal-

lant men (who are at present commanding some of the Irregular Corps), many of whom have gained a European reputation for their prowess as horsemen and swordsmen, are much better capable of discussing the requisite changes than I am, so I shall avoid a topic which I probably do not thoroughly understand.

NATIVE INFANTRY.

There cannot be two opinions regarding its being an absurdity to dress men who, previous to their entering our service, have been accustomed to wear the loose flowing robes of Asiatics, in tight tunics and trowsers, and, I think, the sooner a more appropriate costume is adopted the better. However, as this is a question which one of our able Native Infantry Officers ought to be far better able to solve than myself, I shall merely confine myself to making a few general remarks; and if they are considered worthy of investigation, the details can be worked out by an Officer of that service.

ZOUAVE COSTUME.

I think the dress worn by the French Zouaves would be a very sensible dress for our Sepoys, as the Fez would certainly suit them far better than the hideous ill-shapen forage cap they now usually wear, and, with the addition of a turban, would form an excellent head-dress; and the loose-fitting jacket and waistcoat, and the knicker-bockers and leggings, would also be most suitable. However, should the Government consider that the adoption of the Zouave costume would be too expensive, then I would suggest that the Native Infantry should be clothed in the loose red serge Norfolk jacket and pantaloon-shaped knicker-bockers, which I have already recommended as the working dress for the British Infantry. And as it is equally necessary that the greatest attention should be paid to the fitting of the boots, the remarks I have already made on them will be equally applicable to Sepoy Troops.

CONCLUDING OBSERVATIONS.

In conclusion, I shall now make a few general remarks, although, perhaps, some of them may not be considered to come strictly within my province, as an essayist, on the most suitable costume for the Soldiers of all Arms and Nationalities serving in India.

OFFICERS' DRESS.

In these days of accurate shooting rifles, it is, every one will admit, a matter of the greatest importance that the dress of the Officers should be assimilated as much as possible to that of the men, when on service; therefore, I think, the sooner the useless crimson sash is abolished the better, as it renders an Officer most conspicuous in the ranks; and no one who has not worn it can conceive how much it adds to one's discomfort in India, as it is extremely warm, to say nothing of its being by no means a cheap appendage. The Company Officers should be dressed when in action or on field days, &c., in scarlet serge Norfolk jackets, knicker-bockers, leggings, and boots, the same as the men in cut. And as, the rolling collar, the present system of distinguishing the dif-

ferent grades by crowns and stars could not well be continued, which is so much the better as it is a most inefficient one, I should suggest that the French system of distinguishing the grades by rows of gold tracing braid on the arm be adopted, without any modification whatsoever as nothing better could be devised, as the rank of an Officer is recognised in an instant, whereas the last effort in tailoring in the British Army regarding the sleeve of the tunic, has not been equally successful.

MOUNTED INFANTRY OFFICERS.

As the knicker-bocker and leggings would not be suitable for mounted Officers, I think a pantaloon and Hessian boot should be adopted for them, the same as I have proposed for the Cavalry.

OFFICERS' FULL-DRESS UNIFORM.

I should advocate the Officers having a handsome full-dress tunic, the same as what I have proposed for the men in cut, and with gold cord, which would prove a far neater uniform than the present tunic, with that most useless gold and crimson sash. On ordinary parades, and when on Orderly or Court Martial duty, or when stationed in a garrison town, where it was compulsory for Officers to appear in uniform, I would suggest that permission might be accorded to them to wear the blue patrol jacket and trowsers, similar to those we have at present.

STEEL SCABBARDS.

I have perceived that some writers abuse the present steel sword scabbards, but, in my opinion, it is a decided improvement, being far more soldier-like in appearance and efficient for service ; as what an Infantry Officer requires is a sharp point to his sword, as no man on foot, I think most swordsmen will admit, should think of cutting. I think those who are loud in praise of the useless old leather scabbards cannot have been in the Crimea, otherwise they could not have failed to observe that a vast number, if not the majority, of Infantry Officers had lost the brass tips of their scabbards, and many of them had swords minus scabbards, the leather ones having become perfectly rotten from constant exposure to wet. If the authorities consider that the glittering steel scabbard makes Officers conspicuous in the ranks, that is very easily modified by having them browned like the barrel of a rifle before going on active service, and, I trust, they will never think of reverting to the useless old leather scabbards. I think a steel hilt, such as is worn by the Guards, should be substituted for the brass hilt on the Infanty sword, as the latter is a most inefficient protection for the hand, as a Native armed with a sharp *tulwar* would cut through it with the greatest ease.

SHELL JACKET.

I should advocate that the shell jacket be preserved as a mess dress for Officers, as it is a comfortable and at the same time economical one.

PIPE CLAY AND SOLDIERS' BELTS.

Pipe clay is most objectionable for many reasons, and its use should be discontinued, as, in my opinion, the coarse buff leather belts should give place to bridle leather ones, which would be quite as a strong, far more comfortable, and less liable to stretch.

AMMUNITION.

With regard to ammunition I am inclined to think that the proper way of carrying it would be in two rows, round the waist, in a belt somewhat of the description used by sportmen for their breech-loaders: this belt should supported by straps over the shoulders, like braces to prevent undue pressure on the waist and loins.

Having now had my say, I shall give myself a *nom de plume*, which, I trust, the readers of this essay may consider me entitled to, *viz.*

COMMON SENSE.

Rough notes on formation, equipment, and despatch of a force from India for service in China, Egypt, or elsewhere beyond sea.

By Lieut.-Col. F. S. ROBERTS, v. c., r. a.

From the experience gained in 1860, and again in 1867, when Troops were sent to the North of China and Abyssinia respectively, we can proceed with some confidence to discuss the necessary details connected with the formation, equipment, and despatch of a Force from this country for service beyond sea. We are now well acquainted with the climate and resources of almost every place where the presence of British Troops is likely to be necessary, and, to a certain extent, with the obstacles to be overcome; there ought to be, therefore, no great difficulty in carrying out the necessary arrangements.

The points which appear chiefly to require consideration are—

Strength of the Force.
Season and date of despatch.
Transport by sea.
Transport by land.
Equipment.
Commissariat arrangements.
Medical arrangements.
General remarks.

STRENGTH OF THE FORCE.

The strength of the Force depends so entirely on the object in view, nature of the country, obstacles to be overcome, &c., &c., that to attempt to lay down what number of Troops of the several arms should be sent here or there, without knowing what those Troops would be called upon to perform, would be a mere waste of time; but we can with advantage consider the requirements of an army of a certain fixed strength, any portion of which can be increased or decreased as circumstances may demand.

In some countries, such as the Northern part of China, or Egypt, a large proportion of Horse Artillery and Cavalry might be considered necessary. In other parts of China, such as the neighbourhood of Canton, or in a country like Abyssinia, a predominance of Infantry is essential. If, therefore, we take for our discussion a Corps d'Armée of 24,000 men, there will be no difficulty in altering the composition of such a Force to meet the requirements of the occasion.

A Corps d'Armée of 24,000 men, despatched from India, would probably be constituted somewhat as follows:

	Officers.	Men.	Horses.	Bullocks.	TOTAL Officers.	TOTAL Men.	TOTAL Horses.	TOTAL Bullocks
2 Batteries of Horse Artillery, each ..	6	145	103	74	12	290	3[illegible]6	148
6 „ of Field „ „ ..	6	145	121	74	36	870	7[illegible]6	444
2 „ of Garrison „ „ ..	6	76	10	29	12	152	20	580
2 Regiments, British Cavalry „ ..	28	500	567	0	56	1,000	1,134	0
6 „ „ Infantry „ ..	33	1,000	6	0	198	6,000	36	0
6 „ Native Cavalry „ ..	*8	500	531	0	48	3,000	3,186	0
12 „ „ Infantry „ ..	*8	1,000	8	0	96	12,000	96	0
6 Companies of Sappers & Miners „ ..	3	8 British 120 Natives	3	0	18	48 British 720 Natives	18	

	Officers.	Men.	Horses.	Bullocks.
Giving a total of Artillery	60	1,308	1,132	1,172
British Cavalry	56	1,000	1,134	0
„ Infantry	198	6,000	36	0
Sappers and Miners	18	48	18	0
Total British Force ..	332	8,356	2,320	1,172
Native Cavalry	48	3,000	3,186	0
„ Infantry	96	12,000	96	0
Sappers and Miners	0	720	0	0
Total Native Force ..	144	15,720	3,282	0
Grand Total	476	Officers.		
	24,076	Men..		
	5,602	Horses.		
	1,172	Bullocks, with		
	12	Horse Artillery guns.		
	36	Field Battery guns and		
	12	Guns of position.		

To these numbers must be added followers and baggage animals, for whom transport by sea will be required, and who will amount at the very lowest calculation to—

* 14,500 followers,
8,250 baggage animals,

irrespective of the men and animals for the working of the Ordnance, Engineer, and Commissariat Departments.

The present complement of Officers with Native Regiments is given; but for service in a foreign country, it is essential that several additional combatant and one additional Medical Officer should be posted to each Corps.

It may be urged in defence of the present system that Native Regiments went through the campaign in Abyssinia without any increase to the number of Officers (one extra only being allowed to each Cavalry Regiment to perform the duties of Quarter Master), but the Abyssinian campaign was quite exceptional, not a single Officer was killed in action. Had a severe battle been fought before Magdala, followed, as in all probability it would have been, by engagements in other parts of the country, there can be no doubt but that some of the Native Corps would have been quite *hors de Combat*. No officers could have been drawn from the transport train without injuring the efficiency of that vital portion of the Force, nor could any have been spared from the Re-

* The majority of these are syces, bullock drivers, muleteers, and doolie bearers, **none of whom could be materially reduced without impairing the efficiency of the Force.**

giments, British or Native, in the rear. Every available Officer had previously been withdrawn for the many appointments on the staff, which invariably occur in every campaign, and it is on record that the Commandant of a Native Corps, which advanced but a very few miles from Zoola, objected to one of his Officers being nominated to the staff, in consequence of his finding that, in less than two months after landing, two of his Officers had been invalided from the effects of the climate, and that the withdrawal of another would seriously impair the efficiency of his Regiment.

If we refer to the numerous casualties which occurred in some of the Native Corps most engaged during the mutiny, we shall find that, in the Guide Corps and 1st Punjab Infantry, no less than five Officers were killed and 12 wounded during the siege of Delhi,—the two Regiments having joined the force with a complement of four Officers each. Again, in the 4th Punjab Infantry, at the attack on the Secundrabagh, every Officer was killed or wounded with the exception of a young Ensign who had only been attached to the Regiment a day or two previously. One of the most distinguished Native Officers, while recounting, with an honest pride, the gallant manner in which the Corps had conducted itself in the morning's fight, asked the writer where Officers were to be found to take the place of those who had been killed and wounded that morning, adding "you have seen how well we can fight when properly led: but without Officers to command and *bund-o-bast-kar* for us, we are helpless." Fortunately in those days Officers were plentiful, and able men were soon found to replace those who had fallen in the service of their country. The remembrance of these memorable occasions was fresh in the minds of our rulers when the Force was organized for China in 1859 and 1860, and in consequence eight additional Officers were posted to each Native Regiment ordered for service in that country; there again, the casualties were exceptionally few; but it is believed, for the arduous duties of outposts, escorts, &c., it was not found that one Officer too many had been sent.

Or, if we refer to even more recent times, we shall find that at Umbeyla, where the hardest fighting took place since the mutiny, Native Corps suffered so severely in Officers, that volunteers had to be called for from British Regiments, and Officers had to be hurriedly sent to join the Force from all the neighbouring stations. Fortunately here, again, good and true men were forthcoming, and for service in India no doubt any number of Officers can be obtained by having recourse to those serving on the staff, or in Civil employ, or taking them from Regiments at some distance from the seat of war; but out of India we cannot hope for such an unlimited reserve, and it is not too much to say that, if our Native Regiments are sent on service beyond sea, or at any distance from our frontier with the present complement of Officers, they would be hopelessly crippled after the very first serious engagement, and the Commander, who imagined he had an efficient force at his disposal, would suddenly find himself quite unable to carry out the work he had been selected for, until he was reinforced by Officers from India.

The Force would in all probability be drawn from Bengal, Madras and Bombay; for, in addition to the advisability of employing Troops of all three Presidencies, the embarkations could be proceeded with more speedily and satisfactorily than if the whole Army were despatched from one port,—for the Bengal Troops, the ports of Calcutta and Kurrachee are available,—for the Madras Troops, Madras and Beypoor,—and for the Bombay Troops, Bombay and Kurrachee.

SEASON AND DATE OF DEPARTURE.

If the Force be destined for service in Egypt, Abyssinia, Arabia or Persia, it is believed that it might be despatched at any season of the year; but if the scene of operations is anywhere to the North of China, the time of departure is limited to the six weeks between the 20th March and 1st May, unless, indeed, it were possible to accommodate all the Troops in steamers. From November to March the Peiho is frozen over, and the cold is so intense that, unless absolutely necessary, no operations should be carried on during that period; then from March till the end of May, the N. E. Monsoon blows with such violence, no sailing vessel, even under tow of a steamer, could proceed Northwards from Hong-Kong.

The 1st July may, therefore, be considered the earliest date on which a Force could land in the neighbourhood of the Peiho.

From Calcutta to the Peiho takes a vessel under tow 65 days, and, if we add 30 days more for the unavoidable delays which must occur whenever some 200 transports have to be collected at a certain rendezvous, we come to the end of March as about the date on which the Troops should commence leaving Calcutta and Bombay; those embarking at Kurrachee should start not later than 20th March, while the Madras portion of the force might defer their departure till April.

At the end of March, in Calcutta, there is every chance of Troops being attacked with cholera either in Calcutta itself, or on the passage down the Hooghly. Every precaution must, therefore, be taken to guard against sickness, and, as explained hereafter, the several Corps should be brought down only just in time to embark, and, as soon as the embarkation has been completed, each vessel should be towed straight out to sea.

TRANSPORT BY SEA.

Whether each Corps and Battery embarks fully equipped with land transport, or whether transport for the Force is conveyed separately, the tonnage will not be materially affected, and at an approximate calculation the following amount would be required:

		Ships	Tons.
2	Batteries Horse Artillery ...	... 6	6,600
6	„ Field „ ...	... 15	16,500
2	„ Garrison with siege guns	... 4	4,400
2	Regiments British Cavalry ...	... 14	15,400
6	„ „ Infantry ...	... 30	33,000
6	„ Native Cavalry ...	... 36	39,600
12	„ „ Infantry ...	... 48	52,800
6	Companies of Sappers and Miners	... 2	2,200
	TOTAL	... 155	170,500

Each ship should be complete in every detail, tents, ammunition, baggage, animals, &c., being divided in due proportion, so that each Detachment may be independent and ready to land at any one point, without reference to the remainder of the Regiment or Battery.

An Officer and a few men from each Corps and Battery should proceed to the port of embarkation to superintend all the arrangements connected with the vessels taken up for their regiments, whilst the regiments themselves should be halted at some convenient distance on the line of railway, and there supplied with service clothing, kits weighed &c. So that when brought down they should be ready to embark at once; sickness and disease are always more or less rife in the Presidency Towns, and nothing is gained by having the men in them longer than necessary.

British troops at sea will, of course, be victualled according to the Admiralty scale, and for Native Troops, followers, horses, mules, &c., &c., the scales laid down in paragraphs 121-126—"Transport of Troops by sea," should be adopted.

A suction hose and force pump should be provided in each transport for the sole use of the troops, and they should be tested before the embarkation takes place.

Two chaff cutters with spare shears should be supplied to each horse and mule transport; they should be well tested beforehand, as they are apt to get out of order, and are difficult to repair at sea.

Veterinary medicines, with instructions for their use, should be put on board on each horse transport; and when no Veterinary Surgeon accompanies, it will be found convenient to have the medicines made up before embarkation and labelled ready for use.

The following articles are essential:

* Sulphur ... 1lb.
Turpentine ... 4oz
Mercurial ointment ... 2 „
Linseed oil ... 1 pt.
} Mixed well together.

Mange ointment*
Soap.
Cloth for bandages.
Balling iron.
Drenching iron, and clyster pipe.

The patent clyster pipe should be supplied, as the common one is not so easy to use in a crowded ship, nor is it so effectual.

Horses are very liable to gripes at sea. As a preventative, 20 or 30 corns of black pepper should be given daily in each feed; nothing answers so well if gripes come on,—

¾ seer ghee, or ½ seer castor oil, mixed with 1 ounce sulphuric ether, is a capital remedy.

It is strongly recommended that, as is done in Bombay, all transports engaged at Calcutta and elsewhere should be fitted up by Government. The present system of paying a higher rate per ton, and of permitting the owners to fit up their own vessels, is most unsatisfactory, and, it is believed, more expensive. Owners and agents think of nothing else but making as much money as they can. It is a matter of indifference to them whether animals are lost or injured during the voyage, and the most careful supervision will not prevent their putting up the stalls, &c., as cheaply and as badly as possible.

The very workmen, chiefly Chinese, they employ, will readily take service under Government, and by having the several transports moored together in the vicinity of the dockyard, the work of supervision would not be difficult.

In whichever direction the force is to proceed, it is essential that as much steam power as possible should be secured; for, although steamers are not as convenient for the transport of animals as sailing vessels, they answer admirably for Troops and Followers, and a large number are necessary for towing sailing ships and ensuring the animals on-board these latter, not being longer on the voyage than can be avoided. In the China Seas, at certain seasons, and in the Red Sea, nearly all the year round a sailing vessel might beat about for weeks without making any progress, during which time the lives of valuable animals would be risked, and large supplies of food and forage would be needlessly expended. Each transport should be numbered on both bows and quarters, the figures to be 3 feet long, and to be painted in black on a white square, the four white spaces being each 8 feet long by 4½ feet in depth.

As the actual amount of tonnage required can be approximately determined beforehand, certain numbers should be told off for the several transports at the different ports, in order that the vessel's number may be painted as soon as the tender has been accepted; for instance, all ships engaged at Calcutta might be numbered from 1 to 75

Those at Madras ...	... 76 to 100
Those at Beypoor ...	... 101 to 120
Those at Bombay ...	... 121 to 170
Those at Kurrachee...	... 171 to 200

and so on, according to the requirements of the Troops at each place;

if this is not done, then a letter in addition should be painted above each number, such as—

C. on all Calcutta ships,
M. on all Madras and Beypoor ships,
B. on all Bombay ships, and
K. on all Kurrachee ships.

The first-mentioned arrangement, however, will be found the most convenient.

In addition to these distinguishing numbers, cavalry ships should carry some small flag at their foremast, infantry the same at their mainmast, and artillery at the mizen-mast head.

Lists of the several transports thus numbered, shewing what Troops &c., have been allotted to each vessel, should be made out, and a copy given to the senior Officer on board every ship. This materially assists in determining the whereabouts of the Troops, for the number of each vessel met with can be reported, and moreover, as the general rendezvous is approached, the several Commanders will quickly detect what portions of the Force are on board each transport.

TRANSPORT BY LAND.

The care of all animals required for Army or general purposes may safely be entrusted to the Commissariat Department, increased in Officers and Non-Commissioned Officers to such an extent as will secure the necessary supervision. The Commissariat Department is used to the charge of transport of every description, and a train sufficient to meet the demands of an Army would have a better chance of being properly organized and worked under its superintendence, than if a land transport Corps were specially started for a particular campaign.

For individual Corps and Batteries, however, the Regimental system of transport is undoubtedly the best. The animals will be better cared for, and the drivers better looked after, than it is possible for them to be in a large train scattered all over the country. Animals and drivers in a very few days will become thoroughly fused into the system of the Corps to which they may be attached; moreover, when it is known that enlistment is made for a particular Regiment, men will come forward far more readily for foreign service; indeed, in many instances, the Native Officers and Soldiers will induce their friends and relatives to join, feeling that the drivers will be identified with themselves in every way, and will, under the care and supervision of their Officers, enjoy the same advantages as soldiers; they will be paid regularly, their remittances will be looked after, and, if ill, they will have the best medical attendance.

As soon as animals are made over to a Regiment, drills and parades for loading and marching should be practised, so that, on the Corps

taking the field, the men may be used to the work and perfectly efficient in handling their carriage and manœuvring with it.

One driver should be allowed for every two baggage animals; they must suffer; if not properly cared for; to give fewer therefore is false economy; moreover it is not practicable for one man to water, feed, clean, load and look after the gear of more than two animals,—the driver's work commences at the end of the march; and before he can cook his own food, he must see to the comfort and well being of the animals he has charge of.

It is impossible to over-estimate the importance of having the transport arrangements complete in every detail; the finest Troops in the world are powerless if immovable; and unless the fittings, &c., are carefully studied and prepared beforehand, it is a mere waste of money and labor to attempt to do so at the time of action.

What can be more hopeless than to see a number of mules taken out of one vessel and a number of saddles, &c, out of another, and then to endeavour to fit each animal, with no time or appliances to alter the padding or straps, or probably with no one present capable of judging whether any alteration is necessary,—harness and saddles made for big horses are put on small ponies, resulting in the first march with a gall which increases day by day, until the animal has to be sent to hospital or left to die on the road.

Whether animals are taken from India, or whether they are purchased in other countries, each one should be carefully fitted with a saddle or harness *before embarkation.*

For the saddle, none will be found so thoroughly serviceable as that known as "Hughes' pattern," which consists of a framework of angle iron on a properly stuffed pad; every description of load, whether tents, bedding or forage, can be securely fastened on; it has been tried on the Punjab Frontier for years, and its superiority over all other pack saddles has been proved.

The one essential is, that the iron pack should be made up in an Arsenal and not by contract; the necessity of the iron frame work is an accepted fact, and, being so, it is a *sine quâ non* that it should be constructed of the best material and workmanship, otherwise it would require constant repair, and for a campaign would be useless.

There should be three sizes of saddles, as mules differ very considerably both in shape and size, and a sufficiency of spare material should be taken to admit of the pads being stuffed daily, as will most assuredly be found necessary. Before starting, pads can scarcely be too much stuffed, for after every march the stuffing gets consolidated, and the mules fall off in condition, and the most careful supervision is required to prevent the iron frame work from pressing on the ribs, and thus causing serious wounds.

In almost every country in which mules are used for loads, a different kind of pack saddle is adopted ; but in every description of saddle, the same care and attention are required to guard against the animals becoming unserviceable from galls in the back, hip or shoulder, indeed, it is not possible to lay too much stress on this point. At the end of the march, after the animals have been allowed to cool, each one should be carefully examined to see that there are no incipient swellings or abrasions, and each pack saddle overhauled in every particular, padding should be renewed, straps lengthened or shortened as found to be necessary ; and if the galls have been caused by bad loads, the loads should, if practicable, be changed, or, by the end of the following march, the animal will, in all probability, be quite unserviceable.

All available Maltese carts or other similar vehicles adapted for light draught over indifferent roads should be sent with the force; they are invaluable for transport purposes, and would be most useful either in Egypt, China, or a country like Abyssinia. To draw these, under-sized stud-horses might be used with advantage.

During the last campaign in China, a Coolie Corps pronounced to be a " decided success" was organized at Canton ; this should be done again in the event of a war with China, if not at Canton, at some other locality found convenient; and on the first notice of war being declared, no time should be lost in starting it. The advantage of taking men from the South to the North of China, or *vice versâ*, is that there is no sympathy between the races ; the very language is different, and the men know that, if they desert, no mercy will be shown them by their countrymen.

In Egypt, the supply of camels is practically speaking, unlimited, and they are better adapted for transport purposes in that country than any other animal. Arrangements should be made for a sufficient number being collected, and told off to the several Brigades before the Troops arrive at the port of debarkation.

EQUIPMENT.

It is of the utmost importance that any Force leaving the shores of India should be efficiently equipped in every particular, indeed the success of a small Army entering an enemy's country depends entirely on the completeness of its organization ; no expense should be spared to make this perfect, and nothing that can possibly be required should be omitted.

The soldier should have but one uniform, and nothing answers so well as a blouse or Norfolk jacket made of good English serge ; it should be loose, fastened round the waist by a belt, with two or three buttons, so as to admit of a thick jersey, kummurbund, or a second flannel shirt being worn beneath in cold weather.

Instead of two canvas frocks ordinarily issued to British Troops on board ship, one canvas frock and a second serge jacket should be given,

the latter would be quite as useful at sea and would serve afterwards as a change. Serge is light, and at the same time warm; it can be rolled up into a small compass and washes admirably.

Each British Soldier should embark with the following kit:

In wear—				
			1	serge suit.
			1	helmet.
			1	flannel shirt.
			1	pair of warm drawers.
			1	„ socks.
			1	cholera belt.
	lbs.	oz.	1	pair of boots.
† Great coat ...	7	8	*1	„ gaiters.
Waterproof sheet 5½′ × 8′ ...	5	8	1	Water-proof sheet. (Worn in a roll over the shoulder with the canteen and tin-pot on the top.)
Tin-pot ...	1	0		
Knife, fork, and spoon	0	11		
Towels, 6 oz., pair socks 4 oz. ...	0	10	1	great coat.
Sodawater bottle, full	2	0	1	Metal water canteen covered with canvas.
Haversack ...	0	12		
A day's rations ...	2	12	1	clasp knife tied to the waist, and
	20	13	1	haversack, containing one day's rations, a fork, a spoon, a towel, and a pair of socks.
Arms and accoutrements ..	16	2		These, with his rifle and 60 rounds of ammunition would not exceed 43† lbs.
Ammunition ...	5	7		
Total ...	42	6		

To be carried for him—

	lbs.	oz.
1 spare suit of serge	3	6
1 flannel shirt	0	13
1 warm blue jersey	0	13
1 pair of warm drawers	0	14
1 pair of boots	2	14
1 blanket	6	0
A comb and brush, piece of sponge, a cholera belt, warm woollen night-cap, a calico bandage, and a small clothes brush	2	0
A Bible and Prayer Book between two men each ...	0	11
All to be rolled up in a bag which will form a pillow and will weigh about ...	2	0
Total ...	19	7

* For all services—The mounted branches to wear pantaloons with the gaiters. Infantry and Foot Artillery a loose made trowser or knickerbockers, boots, and breeches do very well so long as a man is on horseback; but nothing can be more inconvenient than such things when on foot, whereas gaiters answer equally well for riding or walking, and should be generally adopted.

or say 20 lbs.

Each Native Soldier should embark with the following kit:

In wear—

1 serge suit.
1 helmet.

1 suit of Native clothes (generally worn under the uniform).

1 cholera belt.
1 pair of shoes.
1 pair of gaiters.

1 water-proof sheet. } Worn in a roll over the shoulder with a few cooking utensils on the top.
*1 great coat. }

*1 metal water canteen covered with canvas.

1 haversack containing one day's rations, a *thalee* and *tawa* for making bread.

These with his rifle and 60 rounds of ammunition would not exceed 43 lbs.†

* For Sikhs, who instead of the cooking utensils named above, should be provided with dekchies of the Bombay pattern, fitting one into the other.

	lbs.	oz.
† Great coat ...	7	0
Waterproof sheet 3′ × 7′	4	0
Cooking pots‡ ...	5	0
Haversack with do. ...	2	8
Aday's rations ...	2	8
Total ...	21	4
Arms and acccoutrements	16	2
Ammunition ...	5	7
Total ...	42	13

	lbs.	oz.
‡ 1 bullooa for cooking dal ...	2	4
1 *kuttoree* for holding ghee and a spoon fitting into ...	0	8
1 brass bucket with cover for water ...	2	4
Total ...	5	0

To be carried for him—

	lbs.	oz.
1 spare serge suit	3	6
1 Native suit	1	8
1 pair of shoes	1	4
1 blanket or quilted razaie	4	0
1 cholera belt and brush	0	6
Additional articles which Natives require, such as dohur, chudder, dhote, doputta, koorta, mirzai &c.	3	4
Total ...	15	0

As a rule, and when arrangements cannot be made for the light articles enumerated being taken as fast as the Troops march, it is far better that they should be carried by the men themselves; the extra weight is more than compensated for by the convenience of having an outer coat at hand to put on in the event of bad weather, and the utensils ready for cooking a meal as soon as the halt is sounded; *but* on ex-

traordinary occasions such as a forced march, or in a difficult country, or when it is desirable that the Troops should arrive at their destination fresh, either when an engagement is anticipated, or when any entrenching work has to be carried out, every thing but the arms accoutrements, and ammunition, should be carried for the men, care being taken that the great coats, water-proof sheets, cooking utensils, &c., are kept with the column, so that in the event of a sudden halt, or of the heavy baggage being delayed, the men will have something to fall back upon.

The above scale gives therefore the following weights for which transport will usually be required, *viz*:—

	lbs.
For each British Soldier	20
„ „ Native „	15
And in proportion for each Warrant and Native Commissioned Officer	25
Each British Officer	50
Mess for every six Officers	75
Cooking utensils at the rate of 1lb. for every British Soldier.	
Quarter Master's stores per British Regiment ...	150
„ „ „ Native „ ...	100
„ „ „ Battery of Horse and Field Artillery	75
Quarter Master's stores per Garrison Battery ...	40
Hospital stores per cent. of British Soldiers ...	80
„ „ „ Native „ ...	20
No allowance for followers.	

Kits should be carefully inspected and weighed before embarkation, and every thing in excess of the regulated scale should be left behind; the debarkation would then be simple, and there would be no collection of heavy boxes and useless articles at the point of landing.

16. As soon however as it could be arranged, a large supply depôt should be formed for the purpose of providing the several necessaries required by Officers and men; cost prices should be charged, and every endeavour should be made to ensure the list of articles being as complete as possible.

Should there be any likelihood of Troops being detained in the North of China during the winter months, poshteens and fur clothing should be sent to the supply depôt for distribution gratis to the Soldiers, and at cost price to the Officers.

18. If these suggestions are carefully carried out, there would be no hardship in requiring the Troops to embark with the kit above laid down; it contains as much as any one can want for three or four months campaigning, during which time arrangements must be made for the supply of new articles.

The followers should be reduced to a minimum, and none but the following should be allowed to embark, *viz:*

For every three horses of Batteries of Artillery and Regiments of British Cavalry	... 1
For every six horses of Native Cavalry	... 1
	Cooks
For each Battery of horse and Field Artillery	... 6
For each Garrison Battery, Troop of British Cavalry and Company of British Infantry	... 3
For the British Soldiers attached to each Company of Sappers and Miners	... 1
Artificers* per Battery	... 10
„ per Regiment British Cavalry	... 12

Bheesties and Hospital Establishments according to regulations.

Bell tents or small pauls† weighing complete not more than 75lbs. should be provided according to the following scale, and in addition, a considerable supply of larger tents, such as the ordinary European Privates' double poled tent, should be shipped for use as depôt hospitals, or as a standing camp at the port of debarkation, in case of more permanent shelter not being procurable.

	Tents.
Every 3 or 4 Field Officers	... 2
Officers of each Battery of Artillery	... 2
„ „ Troop or Company	... 1
„ „ Regiment of Native Cavalry and Infantry	... 3
Every Staff Officer, not Regimental	... 1
Staff of each British Cavalry and Infantry Regiment	... 1
Medical Officers of „ „ „	... 1
Every 14 British Non-Commissioned Officers and men	... 1
„ 6 Native Officers	... 1
„ 18 „ Non-Commissioned Officers and men	... 1
Guard and Hospital British Infantry	... 4
„ „ „ Cavalry, Batteries of Artillery and Native Regiments	... 2
Stores per Regiment and Battery	... 1
Hospital Establishment and Battery	... 1

With each Troop of British Cavalry. Battery of Artillery, and Company of Infantry, (British or Native)

* It would, perhaps, be desirable to increase the number of European Artificers with the Regiments of Cavalry and Batteries of Artillery, and reduce the Native Establishments.

† Pauls are preferable in every way; they are warmer in cold weather, and cooler in hot, and when desirable they can be joined together end on, and a large tent thus formed, but on no account should the entire weight of each be *more* than 75 lbs., 70. lbs. would be even better, for after rain the weight increases considerably.

4 fowrahs or spades,
2 bill hooks and
2 hand axes should be

sent to be carrried, except in the Artillery, with the cooking utensils.

A few spare mussucks should be sent; and if the operations are to be carried on in a country where water is likely to be scarce at any season of the year, "chaguls" should be freely supplied.

If possible, the whole of the Infantry should be armed with breech-loading rifles.

Ammunition should be provided according to the following scale:

Artillery 600 rounds per gun.
Artillerymen 100 rounds per carbine.
Cavalry 100 rounds per carbine,
Infantry 1,000 rounds per rifle.

In the Artillery and Cavalry no special arrangements are necessary for the distribution of the reserve ammunition, but for the Infantry, especially, when the men are armed with breech-loading rifles, it is of the utmost consequence that the "Regimental reserve" should be large, not less than 140 rounds per man, and for this amount transport to accompany each Corps should be provided; with the Field Arsenal there should be 200 rounds per man, and the remaining 600 rounds may then with safety be left at the grand depôt.

COMMISSARIAT ARRANGEMENTS.

In the event of operations being carried on in a country like China or Abyssinia, where little or no facilities for transport exist, in addition to the number of transports given above other vessels will be required for the special conveyance of the animals and stores belonging to the Ordnance, Medical, and Commissariat Departments, though no doubt with proper management a very considerable quantity of the stores could be sent in the Troop ships.

The simplest plan is to place on board each vessel, in addition to the rations for the voyage, three months' shore rations for men, and one month's shore rations for animals; in the event then of there being any delay in the voyage, or of the Troops being landed at any unexpected point, no anxiety need be felt regarding their provision. The actual tonnage for the above is easily calculated, and all remaining space is available for general cargo. As each vessel is taken up, arrangements should be made in communication with the Ordnance, Commissariat, and Marine Departments for this space being properly filled; the nature of stores, whether light or heavy, the vessel can most conveniently carry, should be specified, as also the order in which they should be stowed, and the dates on which they will be received on board.

All stores should be carefully marked, and a list of every thing put

on board should be furnished to the Officer in command of the Troops for delivery to the senior officer at the port of debarkation.

Too much attention cannot be paid to the arrangement of stores on board transports; it must be remembered that at the point of disembarkation labor may be scarce, and that all work may have to be done by the Soldiers and Sailors themselves; the whereabouts of every thing must therefore be known, and every article likely to be required in the early part of the operations must be easily getatable. Unless this is seen to, the Army will be crippled on first starting, and large sums of money will be thrown away in providing material which can never be made use of.

As hay is always more or less scarce in Calcutta and the intermediate Ports of Hong-Kong, Shanghai, &c., early arrangements should be made for a sufficient supply of compressed forage or hay being sent from England in bales weighing not more than 70 lbs. or 75 lbs. each, two of which could be carried by one mule or by three coolies, should it be found necessary to take any beyond the seaboard.

MEDICAL ARRANGEMENTS.

One medical department should be formed for both British and Native Troops; however well a separate organization may answer in times of peace, during war it is essential that there should be but one head and one administration throughout.

Hospital ships for the reception of sick and wounded should be prepared immediately that war is determined upon: they should be fitted up with standing bed places, and should be as airy and open as possible, about 300 cubic feet being allowed for each person.

Condensers should be fitted up in each vessel, and the greatest care should be taken that the vessels are kept pure; the hold should always be well looked after, and foul smells chased away by cleansing and a free use of disinfectants.

Every arrangement should be made to render the hospital ship as similar as possible to a hospital on shore; the Medical Officer in charge should be supreme, and not under the direct control of a combatant Officer, all of whom can be better employed with the Troops on shore. In order, however, to carry out discipline, every ship should be visited daily by a Staff Officer, or the Officer on daily or weekly duty at the port, by whom crimes could be enquired into and minor punishments awarded, all serious offences being entered in the hospital defaulters' book to be dealt with on the man's return to duty, as is done in regimental and general hospitals.

For every two or three hospital ships a Chaplain should be appointed, and, to make the vessel as comfortable as possible, a small library of amusing books, a weekly supply of English papers, and a few games such as chess, draughts, dominoes, &c., should be provided; good Soldiers

chafe at being left behind whilst their comrades are winning honor and glory in the front. Every thing should, therefore, be done to employ their minds, and lessen the feeling of regret and disappointment which comes over a man when he finds himself unable for work, at the very time when his services are most required.

To each Regiment and Battery, a certain number of doolies will be attached, which answer better than anything else for the conveyance of wounded men off the field; but in order to remove these men as quickly as possible to the general hospitals in the rear, and to prevent the field and regimental hospitals becoming crowded some sort of ambulance is required. Should no pattern of ambulance have been decided upon in time, it is suggested that a number of light carts something similar to the Irish car should be sent; they travel well over bad roads, can be drawn by one horse, and accommodate from five to seven men, two or three sitting on either side, and one lying on the well in the middle, in which a small supply of medicines, bandages, &c., could be carried.

GENERAL REMARKS.

The arrangements for the Ordnance and Engineer Parks can best be considered by the Officers Commanding the Artillery and Engineers, but care must be taken that pontoons and a sufficiency of material for crossing rivers and canals accompany the Force; these are especially necessary in a country so intersected with rivers and canals as China is.

No Civilian clerks should be permitted to accompany the Force, nor should any Civil Establishments be allowed in the Post and Telegraph Offices; many Soldiers already know sufficient of telegraphy to be employed as signallers, and for the routine work of the Post Office; no special training is necessary.

The bags for the several Divisions, Brigades, and Regiments, should be carefully made up at the general depôt in the rear; and, when received at head quarters, should be despatched to the Assistant Quarter Master Generals of Divisions, under whose arrangements they should be distributed; in the same way, letters should be made up for despatch. No stamps should be required, and the addressees should only be called upon to pay the ordinary rate of postage; nor should any money be collected on unstamped or underpaid letters; the loss is a mere trifle, and is certainly not worth the extra labor and establishment required to collect it.

At the points where the Troops leave the coast, a general depôt should be formed where all stores for particular Regiments could be received, and all documents connected with men ordered to England or sent on board hospital ships could be made out. An intelligent Non-Commissioned Officer or Soldier who writes well of each Regiment should be left at this depôt, and an experienced Officer, either one who has formerly commanded a depôt, or, perhaps better still, one who has officiated as a Military Store-Keeper should be placed in command. The supply

depôt above recommended might conveniently form a portion of this general depôt.

A depôt is also necessary in some convenient locality in India for the protection of the families and sick of each Native Regiment ordered on foreign service ; it would probably be found that one depôt could answer for two, three, or even more Regiments ; the work is not irksome, being chiefly connected with payment of remittances, and with the care of the effects of men who may die while absent ; but it is very essential that the duty should be carried on efficiently, and, if possible, an Officer should be selected in whom the Soldiers have confidence. Nothing would cause men to dislike foreign service more than a feeling that their private concerns were neglected during their absence ; like all mercenaries, the Soldiers of India are only too glad to go to any place where there is a chance of making money, but every care must be taken that the sums remitted by them for the benefit of their families are regularly paid, and that the families themselves are properly looked after.

A proportion of Native nalbunds and a few blacksmiths will be required for baggage animals, repair of pack saddles, &c., and a few extra mules for the carriage of the stores required for these purposes.

If possible, no vessel containing Troops or any number of followers should be despatched without a Medical Officer being on board.

Photographers should accompany the Force.

FRED. S. ROBERTS, *Lieut.-Col., R. A.*

On the Dress of the British Army in India, European and Native.

BY LORD LYON.

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"The dress of the British Army in India, European and Native," is a subject of great importance and interest in many points, as on it depends in a great degree the health, efficiency, and comfort of our Soldiers. This subject has attracted the attention of many able men from time to time, who have written at length on it, and who have been the means of introducing many reforms and improvements. It is, therefore, difficult to avoid travelling in their footsteps. Nor can it be doubted that to enlarge on their views and maxims will be partly the best plan for carrying out improvements in the clothing of our Troops.

The subject may be conveniently divided into two great sections, *viz.*, I.—The dress of the European Troops; II.—The dress of the Native Army.

I.—THE DRESS OF THE EUROPEAN TROOPS.

The great objects of a soldier's clothing in India are protection against warmth and against cold and wet; the minor considerations have reference to comfort in fit and appearance on parade.

Thus two important points arise for discussion, namely, 1*st*, the materials of clothing; 2*nd*, the make of the several articles of dress.

1*st*.—The materials of a soldier's clothing in India are—(*a*) cotton (*b*) wool, (c) leather.

The advantages of garments made of cotton are cheapness and durability. The disadvantages are 1*st*, it is a great conductor of heat; 2*nd*, it is a bad absorber of moisture. Its cheapness and durability make it a most suitable material for the garments of our Troops in India. Hence we find it worn during the day by all our Troops in India in the hot months, and generally after the rains; in the cold weather woollen clothing is worn day and night by the Troops.

Cotton, by its toughness and strength of texture, is peculiarly suitable to Indian usages, remarkable among which may be mentioned the mode of washing and the constant washing to which white clothing is subjected.

It is universally acknowledged that it is injurious to wear cotton shirts next the skin, as cotton conducts heat so rapidly and absorbs so little water of perspiration that it is likely to produce chills after any exertion, and thus cause liver diseases, bowel affections, and fevers.

Wool, by its properties of slow conducting power and free absorption of perspiration, is *par excellence*, the material for under-clothing in India at all seasons by day and night. The property of "hygroscopic absorption"—the manner in which water penetrates the individual wool fibres and distends them—is the one which enhances the value of wool for clothing purposes.

During exertion the evaporation of perspiration from the surface of the skin acts as one of the great cooling powers of the body; and, when the exertion is over, this vapour from the skin is condensed in the wool, and returns to the body the great amount of heat rendered latent when the water was vaporized; thus chills are kept off, and a pleasant warmth is felt, contrasting favourably with the dangerous and uncomfortable cold wet feel of a linen or cotton shirt.

Woollen under-clothing keeps the skin in a state of hygienic moisture, and from its bad conducting power is warmer than cotton or linen and a better protection against cold winds. The great disadvantage of woollen clothing is the way in which it shrinks after repeated washings; and when a woollen garment gets old, it loses a great deal of its heating properties and becomes hard and thin.

Leather, as it enters into the formation of boots only in India, demands a short description. It is generally of excellent quality now, and the boots for the Troops are made up at home. When the question of the make of garments comes to be discussed, boots will meet with a proper share of attention.

As in India the great object of clothing is protection against heat as regards European and against cold in the case of Native Troops, it will be sufficient to describe the properties of cotton and wool when made into garments. To protect the body from the direct rays of the sun, the color and not the texture is the important element. Of all colors, white is the best; next in the order of merit comes grey, then yellow, pink, blue, black; therefore it is manifest why white American Drill has been adopted as the dress of Europeans during the greater part of the year, and of Native Soldiers in the hot weather months.

It is, however, to be remarked that, in the shade, we estimate the qualities of a garment as to its heat-giving powers by its texture, thickness, and its conducting power, and not by its color. The thicker a garment, and the lower its conducting power, the hotter it is. Leather is the next hottest material for clothing after wool; it does not let any wind blow through it, and keeps in a good deal of perspiration. India-rubber is the hottest material of clothing, as it entirely prevents any perspiration evaporating from the surface and hinders the entrance of cold wind.

Wool possesses the properties in addition of being the best absorber of perspiration and odours; and if the garment is black, it will absorb odours better than one of any other color, the order of merit being black, blue, red, green, yellow, and white.

It is a disputed point as to whether flannel under-clothing is a protection or not against malaria. I am inclined to think it is, as it has been stated by some that soldiers who wear flannel shirts suffer less from fever than those who wear cotton ones. Combe asserts that at Rome wearing flannel under-clothing has some effect in lessening the risk of malaria. On the West Coast of Africa, wearing flannel under-clothing has been tried with good effect, not only as regards malaria, but as touching other diseases. It is, therefore, to be strongly recommended in India for the same purpose.

THE MAKE OF GARMENTS.

The variety of garments worn by the Troops in India is great. The European Soldier has a multiplicity of articles in his kit, which may be considered under the heads of (*a*) under-clothing and (*b*) outer-clothing.

Under the heading of inside-clothing the most important things to be considered are shirts and socks. Drawers are only worn by a few, it would, however, be a great improvement if they were worn by all European Soldiers, whenever they wear black cloth trowsers.

Cleanliness and comfort would thereby be greatly promoted, as the accumulated perspiration and cutaneous exhalations in a black cloth trowsers, never washed, makes the garment a suitable abode for vermin, and perhaps cause skin diseases. Drawers form no part of a Soldier's kit, but it would be a vast improvement, if a couple of pairs of thin cotton drawers were kept up by each man, and the cost to him would be trifling.

Shirts are the most important part of a Soldier's under-clothing; and there are two kinds of shirts in use in the Army—flannel and cotton. Each European Soldier is required to have in his kit either two flannel or three cotton shirts. At home most men keep cotton shirts; but in India, where they have more money at their disposal, flannel shirts are preferred generally. The men like cotton shirts for their cheapness and durability; but unless a flannel vest or Jersey is worn inside the shirt, next the skin, a cotton shirt is unsuitable for wear in India. These flannel vests may be had at the Quarter Master's stores for Rs. 1-14 each, and, when worn under a calico shirt, a man may be said to be suitably under-clothed.

As regards flannel shirts they are theoretically the best under-clothing for the reasons stated in the beginning of this essay; there are, however, some important practical objections to their use in the Army; for instance, they require more constant washing than cotton shirts, and they are apt to shrink and become hard from constant washing; this shrinking is most apparent about the collar and sleeves, preventing these parts from being buttoned, and so making the shirt uncomfortable.

Moreover, it is probable that in time of war scarcity of water would render the washing of flannel shirts a matter of difficulty; but this ob-

jection would equally apply to shirts of any material; and a flannel shirt may be rendered partially clean by Parkis's plan, namely, exposing the shirt to the sun, beating it and shaking it, and then wearing it day about with the other flannel shirt, as each man is supposed to have two in his kit. By this plan much dirt and many vermin are got rid of.

On active service none but flannel shirts should be worn by European Soldiers; and I might suggest as an improvement that all flannel before being made up into shirts for the Army should be well shrunken by steeping in hot water for one hour, and then slowly dried by evaporation; hanging in the air will do: it should not be squeezed: this process is then to be repeated with cold water.

I have tried this plan with success, and strongly recommend it. Another plan is to have the collars made of strong linen of the same color as the shirt, and at the same time the wrist bands or cuffs might be of the same material, with a tuck in the sleeve to be let out when necessary. By adopting any of these plans, the present regulation grey flannel would make a capital shirt.

An objection to the present flannel shirts has been made, namely, that they are too hot and irritating for India, where boils and prickly-heat prevail. There is no doubt some force in this objection, and the plan recommended by Dr Parkis might be tried, *viz.*, mixing about 30 per cent. of cotton with the wool; this would make the shirt much cooler, and would almost prevent shrinking from constant washing.

SOCKS.

Woollen socks are issued to the Soldier from the Quarter Master's store: a mixture of equal parts of cotton and wool would be better: it would be a good plan if all socks were well shrunken before being tried on. Each European Soldier has three pair of socks in his kit.

OUTER-CLOTHING.

The outer-clothing worn by the Troops varies according to the several branches of the service, and the season of the year. European Cavalry and Artillery wear their English tunics or stable jackets during the monsoon and cold weather months generally; and in the hot weather a white jacket of American Drill. Trowsers of a color and material the same as the coat are worn at the same time.

That a thick English cloth tunic or stable jacket is an unsuitable dress for Europeans in India is a notorious fact, and a change has been frequently recommended. It would certainly be a boon to Cavalry and Artillery Soldiers to have a loose comfortable blue serge patrol jacket of somewhat the same pattern as that worn by the Infantry, in place of their present tight uncomfortable tunics and stable jackets. Their duties in the stables and gun sheds are much more arduous than those of the Infantry Soldier, whose work is almost *nil*. The shell jacket is not suitable for India, and is not generally worn. Colonel Bray, 4th Foot,

has devised a waistcoat with sleeves: it is meant to be worn inside the red serge, and it would be particularly valuable to troops stationed on the hills or in cold stations in the north of India.

The red serge worn by British Infantry is a capital dress for India, or any country occupied by our troops, Canada excepted. It has been adopted for the Army serving at home under the name of the Norfolk jacket. The only improvement I could suggest in it would be, that it should have four eyes on each side of the back seam on the inside of the coat, extending from the collar twelve inches down the back; the eyes on opposite sides to be three inches apart: to these eyes a flat pad made of linen or canvas and containing cotton wool could be hooked on; this pad would be twelve inches long by three wide: it would lie on the backbone, and being inside the coat would be unseen and form a perfect covering to the spine in the hot season: it is a well-known fact that the sun has a very powerful effect on the spinal cord, and that this delicate organ requires protection from the direct rays of the sun. This pad would be one inch thick, and lying along between the shoulder blades inside the coat, would defy detection and thus be no eyesore.

I have taken this idea from the dress worn by shikarries and others travelling in the jungle in the hot weather. I have latterly worn this pad on my own shikar coat, and have experienced the greatest comfort from it in the hot weather. In all Indian stations in the hot weather it would be a cheap, simple, and, I believe, a valuable contrivance against sun-stroke: its price would not be more than a couple of annas, and by having two of them, a Soldier could have one on his red serge and the other for his white coat: the eyes on the latter should be made of thread so as not to iron-mould the coat in washing.

The white American Drill makes a capital coat, and is worn by all European Troops in the day time, that is, from 9 A.M. to 5 P.M., in most stations nearly all the year round, in the hot weather it is worn by sentries at night. It would be an improvement if both the serge and white coats had pockets on the inside made of some strong material; these pockets might be placed two in front in the skirts and two on the sides; being inside they would be unseen and be a great convenience to a Soldier on a campaign.

TROWSERS.

Two kinds are worn by Europeans, white American Drill for the hot and black cloth for the cold weather months.

These pairs of trowsers need no description; they are of good quality, a proper make and suitable to the seasons. With the black cloth trowsers thin cotton drawers should invariably be worn for the sake of cleanliness as before mentioned.

Like many other things, it took a number of years before the present comfortable trowsers were issued to the Army, the Soldier having first had to pass through the ordeal of breeches and gaiters, contemporary tortures with the black leather stock and tight coatee.

The most perfect trowsers for a Soldier is the peg-top pattern, loose over the hips and knees, and tight about the ankle; the latter a most useful safeguard against thorns, &c., to Troops marching through the jungle.

BOOTS.

Of all the articles of a Soldier's kit none are more essential to his comfort and efficiency than a good pair of boots (Duke of Wellington). The boots now issued to Europeans are an excellent ankle boot to the Infantry, and short Wellington's to the mounted Corps. The ankle boots lace up the front; they are large and comfortable with good wide heels and soles, and they do not compress the foot or cause the toes to override: they are well suited for marching and campaigning. The fact of having a low and wide heel and sole is of immense advantage as there is a good base to support the centre of gravity of the body, the line of which runs down through the middle of the heel: thus the greater part of the weight is borne by the strong heel bones as nature intended it should be, and the weight is not thrown forward on the toes.

Great care is taken at Pimlico in the manufacture of Soldiers' boots; the leather, stitching, and size are all tested. A certain number of boots in each lot are cut up and examined, and if the quality of the leather is inferior, or the number of stitches in a inch less than the the standard laid down, the whole lot from which these boots were taken is condemned.

Mr. Dowie, a boot-maker in the Strand, London, has introduced a boot with an elastic instead of a rigid waist; the waist is the part connecting the heel with the sole; there is thus very little muscular effort required in bending the waist; as a military boot they have never been extensively tried, as they are rather more expensive than the ordinary boot.

"The Hythe Boot," introduced by Colonel Carter, is on the same principle, namely, to lessen the rigidity of the sole of the boot: his plan is to have a slit across the tread. On the whole it is a very doubtful if any of these boots are better for Soldiers than the one now in use; and as there are at present thirty-two sizes of boots, eight in length and four in breadth it must be a very extraordinary shaped foot indeed that cannot be fitted.

Mr. Dowie has written a book on the subject, and he states that at the battle of Maida, the Highlanders when ordered to charge had to stop and pull off their boots before they rushed at the French.

The Hussar boot and breeches are a more useful and serviceable dress for Cavalry than the present trowsers; they are also more comfortable and easier to ride in. Boots can be made water-proof in the following way: "Take half a pound of shoemakers' dubbing, half a pint of linseed oil, half a pint of solution of India-rubber, (price two shillings per gallon,) dissolve with gentle heat (it is very inflammable,) and rub on the boots. This will last for five or six months." (Parkes.)

THE GREAT COAT.

This has been called the most important article of a Soldier's kit by many authorities, from the Duke of Wellington downwards.

The one at present issued to European Soldiers is of an excellent quality: it only wants a hood to go over and protect the head when a Soldier is campaigning, and a couple of pockets to make it perfect. A short description of the coat will suffice: it is made of stout blue cloth with red piping, it is double-breasted and a comfortable length.

In Scind and Northern Indian stations, where extremes of temperature occur in the cold weather season, sheepskin coats are worn by European Officers, and are a most perfect protection from piercing cold: in the Punjab and northern hill stations, where water freezes, a coat of this description ought to be issued to European sentries at night, and it would be the means, I believe, of lessening lung and bowel affections so prevalent in some of those localities.

A cloak is worn by European Cavalry and Artillery; it is larger than the Infantry great coat; the cape unbuttons and can be worn separately: when riding the cloak covers a considerable portion of the horse as well as the man.

HEAD DRESS.

Helmets and forage caps of different patterns are worn by European Troops in India; the Cavalry and Artillery are much better off in this respect than the Infantry. The helmets of the former are made of leather with an inside chamber all around to allow the circulation of air: the outside of the helmet is kept white and shining by pipe clay, and a white cotton puggree is worn around the helmet. This is a capital head dress, it looks well and smart, and is a good protection to the head; a double iron hoop crossing at the top would give it increased strength to resist sword cuts.

In the Infantry a wicker work helmet is worn. The one now issued is a smart looking head dress; it is very light, and for the cold weather months is a sufficient protection to the head. It has, however, many disadvantages; for instance, it does not cover sufficiently the back of the head and upper part of the neck, and thus these parts are exposed to the sun: the material of which the helmet is composed is not suitable or sufficient to protect the head from the heat of the sun; something thicker and denser than wicker work is required, and this, I believe, would be found either in leather or hard felt; the shape should correspond with the one worn by the Artillery. This could be easily kept white and shining by pipe clay, thus having the double advantage of reflecting the light and heat, and doing away with the necessity of keeping topee covers and the trouble of putting them on. I am convinced that the head would be much cooler under a topee of this kind than under the present thin wicker work one, and the head would be safer from a sword

cut than it is now. The helmet should have the double iron hoop as before described.

It is a notorious fact that the wicker work helmet harbours bugs in great numbers sometimes, and when once they have taken possession of a topee, it is next to impossible to expel them: these filthy insects have a fine field for their operations when a man is drilling with his helmet on; they then travel undisturbed, consequently when the word "stand easy" is given, it is most suggestive to see the number of men who take their helmets off to disperse their tormentors.

As a decoration, a plume of the same shape and material as the Light Infantry plume might be worn on the helmet, where the present unsightly round knob projects; the plume might be the color of the facings, the staff of the plume should not project more than about two-and-a-half inches from the topee, with a slight inclination forwards: the plume would then hang back over the topee and would be ornamental.

In the dress worn by European Infantry the facings are not shown: a plume of the regimental color would show at once the facings of the regiment; it would make the men look taller, and would give the helmet a nice finish, making it an ornamental, martial-looking head dress: the appearance of a Regiment in line would by it be greatly improved. The plume could be easily taken out during the process of pipe-claying the helmet.

Light Infantry and Fusilier Regiments could have their distinctive marks in the plume. Various kinds of helmets have been proposed by different authors, Jeffreys, Miller, &c. The principle of all appears to be reflection of the solar rays by means of a bright metallic surface; the idea is theoretically correct, but it cannot be reduced to practice; 1*st*, because brass or steel helmets should never be worn in India, owing to the conducting power of these metals; 2*nd*, the expense of covering ordinary leather helmets with a bright metallic surface would be very great, as aluminium is the only metal light enough for a coating, and this is much too costly to be applicable to the purpose.

Forage Caps.—The old forage cap will soon be replaced in the Infantry by the Glengarry cap: this has been issued to some Regiments at Home, and it is to be hoped it will be brought generally into use; as no better undress cap could be possibly found, being soldier-like by day, and it forms at night a comfortable night cap, an important matter on active service.

The Cavalry and Artillery forage caps are smart and soldier-like; no change need be made in them.

DRESS OF OFFICERS.

Before going into a description of the dress of the Native Army, it may be advisable to make a few remarks on Officers' uniform in India.

Cavalry and Artillery Officers, like their men, wear during a part of the monsoon and cold weather months, the same thick cloth tunics, and patrol jackets as the men. The tunic is only worn on a few parades, but it would be a great boon to Officers and to the men if the loose blue serge jacket, of the same shape as the Infantry, took the place of the tunic and stable jacket in India. The serge jacket has been before described and could be easily made ornamental enough for these branches of the service : however it is to be remarked that gold lace or braid easily tarnishes from the heat, and when tarnished looks badly ; therefore the less of it worn in India the better.

In the Infantry, Officers dress in the same pattern coat as the men, red serge or white drill, according to the season.

II.—THE DRESS OF THE NATIVE ARMY.

This important division of the subject will require a somewhat lengthened description, as there is no doubt whatever but that our Native Soldiers are both insufficiently and improperly clad. To begin with the Cavalry.

In the Madras and Bombay Regiments the turban is too small, it affords no protection from the sun or sword. Bengal Cavalry are infinitely better off in this respect, as in many others, than their fellow Soldiers in the other Presidencies. The Central India Horse have a fine handsome looking turban, which contrasts favourably with that of the Bombay Light Cavalry. Each sowar ought to be furnished with a " kaun topee" for night pickets and escort duty, &c. ; this would protect his head and ears, and it is a notorious fact that Natives are peculiarly sensitive as regards these parts, as may be inferred from the way in which they muffle their heads up.

The body clothing of the sowars is suitable enough. The coat wants a collar to fasten with hooks. This would improve the appearance of the coat and afford some protection to the neck. Flannel vests should be issued in the cold weather.

In Scind, the men in the Mountain Battery and Scind Horse wear sheep-skin coats in the cold weather, and a garment of this kind would be an admirable dress for sowars generally at early morning parades in the cold weather. The insufficient clothing of the men is unquestionably a powerful cause of lung diseases, fevers and bowel affections.

The Hussar boots and trowsers are very suitable and comfortable to ride in, no alteration need be made in them ; the leather is however apt to get hard and dry from the heat ; a suitable preparation of oil, &c., might be issued from the Quarter Master's stores to keep them soft.

THE NATIVE INFANTRY.

This important section of our Indian forces is notoriously improperly clad in many respects.

After securing the body from effects of heat and cold, our object should be to provide a garment or garments of a soldier-like appearance, and that do not interfere with the movements of the body. Now it is very apparent that the present clothing of the Native Infantry embraces none of these objects. In the hot weather their clothing is too hot; in the cold weather it is not warm enough, and on the whole their appearance is cramped and their marching powers, naturally enormous, are marred by buttoning them up in a tight cloth tunic, and encasing their feet in ill-made heavy boots.

As regards the forage cap with its cotton puggree, no change need be made, as it is a sufficient covering to the head: it would look smarter if it was cut down a little as it is rather high.

The Tunic.—The best authorities on army clothing at home unanimously condemn the tight buttoned-up tunic, and regard it as a potent cause of heart and lung affections. (Maclean, Parkes, &c.) Their recommendations have been attended to, and the loose Norfolk patrol jacket is to be the dress of our men at home on all ordinary parades, the tunic being reserved for particular occasions. This is the plan I would recommend strongly as the most suitable for the sepoy; it would have many advantages, as his chest would no longer be fixed as if in a mould, and during active exercise the action of his heart and lungs would be unimpeded: the motion of his arms too is certainly restricted by the tightness of the present tunic which is an extremely badly fitted garment.

A red cloth patrol jacket of the same pattern as the one issued to European Infantry would be an admirable and serviceable dress for the cold weather months, and it should be supplemented in its heating powers by a woollen Jersey, which would cover the chest and abdomen. Thin Jerseys should be issued to the men from the Quarter Master's stores; their cost would be trifling, and they would be an invaluable preventive against pulmonic and bowel affections so prevalent among Native troops.

Uniformity on parade with European troops would be promoted; surely nothing can be more unsightly than the present tunic on a slight man—as nearly all Natives are—with its tight sleeves, and general bad fit. For the hot weather months the present white garment is suitable.

At night in the cold weather sentries should be invariably provided with an extra covering, such as a sheep-skin coat coming down to the knee. On active service each sepoy should have one of these coats: in times of peace it would be sufficient to have some in each regiment to be worn by the sentries at night.

TROWSERS.

The present black trowsers if retained in use would require some important alterations to assimilate them as much as possible to the peg-top pattern, which is undoubtedly the most suitable for infantry soldiers.

It would be perhaps better to introduce the Zouave trowsers and gaiters; the trowsers to be made of some thin material, strong and durable, to keep out thorns: they should be wide at the hips and contracted at ankles; and the gaiters might be of plain unpolished leather, sambur skin for instance, with a good flap in front to cover the instep: the gaiters would go over the trowsers and need not go higher than six inches above the ankle.

BOOTS.

These encumbrances to a sepoy should be abandoned altogether, and light Native shoes substituted. Expecting celerity in movement from a sepoy wearing the present boots is out of the question, nor can they march in them without much suffering and foot-soreness. The boot is dirty too from the perspiration of the foot soaking into the leather as sepoys wear no socks; and as a rule, escorts and the men of irregular corps when making long marches take off their trowsers and boots especially in the hot weather, and march in their own shoes; the distance they can then march is astonishing.

This plan of giving the Native Infantry Zouave trowsers, gaiters and Native shoes, would be conducive to cleanliness, as at the end of a march the gaiters and shoes could be taken off and the foot cleaned: the foot also would be much more cooler and be better protected from thorns in marching through a jungle.

CONCLUSION.

Before drawing to a close it may be well to state that the writer's object has been to advance the principles laid down by such authorities as have paid most attention to the clothing of our soldiers, and to combine the author's own experiences on what is most useful and comfortable for India. The rude touch of war is the great test of the suitablity of a soldier's dress. Under this searching trial every thing useless and uncomfortable will surely soon disappear, without any regard to the designs of the tailor or the orders of the martinet. Ornaments and useless encumbrances should never weigh against comfort, utility, facility of repair, and effectiveness.

Should the foregoing views on clothing tend to the improvement in comfort of the British and Native Troops, the writer's great wish shall have been fulfilled.

Notes on the Field Equipment of Troops.

By Lieut.-Col. C. M. MACGREGOR.

CAMP EQUIPAGE.

I PROPOSE first to consider the question of Camp Equipage, and it is evident that, in doing so, it is impossible to fix on any one form of tent which shall equally suit the exigencies of all the varied service required from it; and even if, by inventing a complicated form of tent with many extra flies, walls, cloths, &c. it were possible, it should be borne in mind that simplicity should be the first principle in all Military equipment, and that scarcity of transport may forbid our increasing weight beyond barest necessities.

Taking, therefore, for granted that the present E. S. D. P. Tent is the best suited for service in the plains of India either for ordinary route marching or when Troops have to seek refuge from cholera or other epidemic, it is best to limit this consideration to the tent best suited for the use of European and Native Troops in service among mountains, or beyond the sea, where carriage is scarce and the climate more temperate than that of India.

First then, what are the requirements of such a tent? Are they not?

Lightness; durability; imperviousness to rain, wind or sun; easy and secure pitchment; goood ventilation; simplicity of construction?

Of course as regards the 3, 4, 5, 6, points, our Indian double and single poled double flied tents are superior; but they are so completely placed beyond the pale of consideration by their immense weight, that if we look to Indian tents at all, we must only take the smallest description, namely, the different Sepoys' Pals in use in the Presidencies; and by turning to Europe we shall not much increase our field of selection, for from the infrequent use of any camp equipage in European campaigns, no great experience has there been attained. The only European tents likely to suit our purpose, then, are the English single fly bell tent, and an improved double fly tent of the same pattern which was used in Abyssinia for Officers and Hospitals.

But with reference to our first desideratum, namely "lightness," what is meant by it? It is not merely that such a tent shall be light in comparison with its size, with the accommodation it affords, or the protection it gives from the weather, but that it shall be so light that two shall be carried on one mule, or one on one coolie, that is to say lightness means a tent weighing not more than 70 lbs., and there are very good reasons for taking 70 lbs. to be the maximum weight of a tent complete, for it is the ordinary load of a hill coolie; 2 such tents form a light load for a mule, 3 a fair load, 4 form a light load for a camel, and 5 or even 6 a fair load, 10 form a light load for the admi-

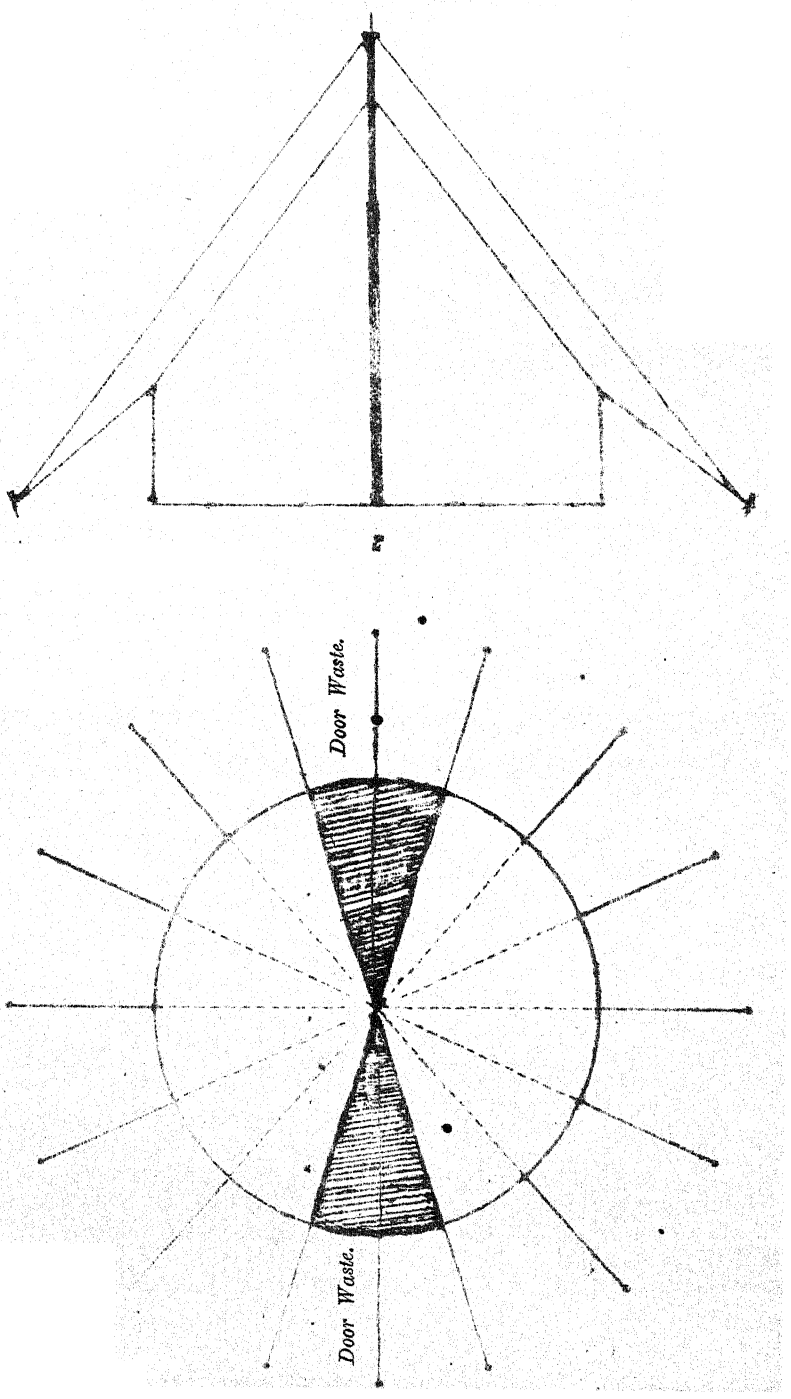
rable Maltese cart, and 15 a fair one, and the same may be said of an elephant. Thus, this weight of 70 lbs. is suitable to all the different descriptions of transport likely to be employed on service of the above-mentioned description.

And the English single fly bell tent, which is the only one of this weight, has other advantages; it is most durable, it gives accommodation to a large number of men comparatively with its size, and it absorbs very little moisture. But, on the other hand, it is so pervious to sun, so wanting in ventilation, as to annul its other good qualities and make it unfit for any one to live in, even in a temperate climate. And this opinion is upheld by the experience of the China and Abyssinian campaigns, when these tents were used; by the opinion of Lord Napier, who, through his Quarter Master General, in a report, dated Zoolla, 1st June 1868, condemns the bell tent as "being very hot" and "not capable of keeping out the strong rays of the sun,"—by that of a Committee assembled at Sherghotty on 4th November 1859, who condemned some of these tents, which had been issued to the Ludiana Regiment, as being "totally unsuited for Troops either European or Native in an Indian climate, as they are of a single canvass and have only one opening, therefore no ventilation is obtainable, &c.,"—by that of Lord Clyde, who in forwarding the Proceedings of this Committee with his letter No. 4753, dated 15th December 1859, concurred with regard to their condemnation as follows: "and Lord Clyde thinks justly so, as they appear very inferior as regards the necessary shelter to the Pals now in use with Native Regiments, and he would recommend their being returned into store as soon as they can, and replaced by Pals, and not re-issued except in cases of emergency,"—and finally by the decision of Government on the same question, where, in Military Department letter No. 95, dated 5th January 1860, the Hon'ble the President in Council approves the above recommendation *in toto*. The question, therefore, of the suitability of the Bell Tent for even Native Troops is not a new one but has been considered and settled before.

It therefore only remains to discard it entirely, or to improve it, and there is no doubt it can be improved as was done for Abyssinia by the addition of another fly and a three-foot wall, thus making the tent very pleasant even in considerable heat, and when the old pattern was simply unbearable; and if in addition to these improvements another door was made immediately opposite, so as to admit of a free current of air passing through the tent, it would be nearly all that is required as regards comfort. But these alterations would very nearly double its weight.

It will be well, therefore, to see if the other shaped tents do not admit of being improved without exceeding the maximum weight of 70 lbs,: we have seen that as regards shape, the Bengal Sepoy's Pal is perfect, but it is very heavy,—heavy however only because of the material it is made of, *viz.*, "dosootee," which for considerable weight, gives very little protection, and must be doubled or trebled to afford any, and which absorbs moisture to an immense extent.

DOUBLE FLY BELL TENT.



If, therefore, a tent was made throughout, inclusive of pegs and poles, of exactly the same material as the English bell tent, it would combine the great lightness and durability of that pattern with the advantages as regards ventilation of the Pal. But without a second fly of some sort, it has been allowed that a single cloth of English linen is not sufficient, even with the better ventilation afforded by the pal shape, and as in giving this additional protection to the bell tent we find its weight to be nearly doubled, and as, moreover, the weight of the poles in a pal tent adds considerably to its weight, it becomes necessary, if we wish to keep down the weight, to do without this extra fly, and luckily the peculiar shape of the pal, aided by the very simple contrivance of making the poles longer, enables us to do this by using the men's blankets as an extra fly during the day, *vide* Figure 3, Plate II.

It may be said that the blankets could also be used for the bell tent, and thus also enable us to do without a double fly for it, but this is not the case, for the shape of the bell tent is so awkward as to make it nearly impossible to fasten blankets securely on it, and moreover, even if they could be so tied, it would not even then be nearly so cool as the pal shape; because beside the advantage the latter has from its two doors, the plan of having poles two feet longer than the height of the tent enables the blankets to be kept at least two feet off the fly,—an immense point, for immunity from heat does not so much arise from the number of folds in a tent as from the distance of these folds from each other.

A reference to the sketches which accompany these notes will show the details of the two descriptions of tent, *vide* Figures 1, 2, Plate I., and Figures 1, 2, 3, Plate II.

The writer has a tent of his own, 10½ feet long, 8 feet broad, 6 feet high, with an outer fly 2 feet higher, and weighing all complete 70 lbs. and costing about £ 8.

This was proved by actual experiment to be able to accommodate 12 Natives closely packed, 10 more comfortably, and 8 quite comfortably.

And it now only remains to lay down a scale of the proportion in which these tents shall be issued, and it may be better to premise this consideration by a remark that, on very many occasions during field service, it is far better to dispense with tents altogether, for however light and however portable they may be made, they still must add something to the baggage, and the number of animals, and that this can be done is proved by the experience of Ambeyla, Bhootan, and also in a measure by that of China and Abyssinia.

It will be seen also that, while these pals are fit for Troops on service in hills or in more temperate climates, they are fit for the use of Troops in ordinary route marching in the cold weather of Northern India, with the addition of a fly (the extra weight of which on such occasions would be no objection), and supposing the facilities for placing extra blankets are taken advantages of to their full extent.

Another advantage of the pal shape is, that any number of them can be added together, so as to give more heat in cold weather, to take advantage of limited space among mountains, and also for use as hospital and store tents on a large scale. It is adaptable for 10, 8, or 6 as a single tent, and for double, treble, or quadruple these numbers according to the purpose for which it is required, or to the number put together.

The scale I would propose is.

For British Troops on Service, Cavalry, Infantry or Artillery.

Every 8 men	...	... 1 Tent.
Quarter Guard	...	... 1 „
Rear „	...	... 1 „
Magazine „	...	... 1 „
Hospital for 50 men	...	. . 1 „
Commanding Officer	. .	... 1 „
Every 3 other Officers	...	... 1 „
Every 6 Staff Serjeants	...	... 1 „

Native Troops, Cavalry or Infantry, on Service.

Every 10 men ...	...	... 1 Tent.
Hospital, every 75 men	...	... 1 „
Quarter Guard	...	... 1 „
Store	...	... 1 „
Commanding Officer	...	... 1 „
Every 3 other Officers	...	... 1 „
Every 6 Native Officers	...	... 1 „

If this pattern were adopted, it would, of course, be so only prospectively, yet I think no new tents of any other pattern except this and the E. S. D. P. Tent should be made up, and all Native Troops throughout India should be provided with the same, as their regular camp equipage. There could then be no difficulty about Regiments of one Presidency being supplied from the arsenals of another.

Until one of these tents were made up, it is, of course, impossible to give an estimate of the cost, but it is not probable that it would cost more than a single fly bell tent.

PERSONAL EQUIPMENT.

Regarding the Regimental and personal equipment of Troops, it is evident, I think, that the question resolves itself into one of baggage, for, of course, it is easy to equip a Soldier to perfection, if no limit is placed on the amount of baggage which can be carried for him, but when not only a limit, but a very low one has to be placed, it is not so much what is perfection we have to consider, as what is best under the circumstances.

In a list of equipment supplied to Troops for service, the

first article to notice is the kit bag. This is an excellent article for ordinary route marching; but inasmuch as it adds 5 lbs. 6 oz. to the weight, and is only useful as a kit bag, it is better to do without it, and in its place provide a strong water-proof sheet 7 feet by 4 with eyelet holes at intervals all round, so as to enable the Soldier to use it as a *tente-d' abri* if necessary, to afford ample protection to him from all damp and to pack his bedding in on the line of march.

The soldier should, therefore, have only the following articles of equipment:

On.

	lbs.	ozs.
1 flannel shirts.		
1 cotton suit.		
1 pair boots.		
1 helmet or turban.		
1 kammurbund.		
1 pair mail bag cloth gaiters, and		
Rifle and belts	13	4
Mail bag cloth haversack full ...	3	0
Water canteen...	3	1
Cloak	4	7
60 rounds ammunition	6	0
Total carried by Soldier ..	30	0

Off.

	lbs.	ozs.
1 cloth suit	5	0
1 serge do.	2	14
1 water-proof sheet	3	0
1 English blanket	3	14
1 pair boots	2	14
1 forage cap	0	12
1 towel	0	8
1 flannel shirt	1	0
	19	14
Total carried for each man, say ..	20 lbs.	

The blanket should be grey, 7 feet by 4, with eyelet holes. The boots should be strong, made of soft leather, with broad* soles and with buckle fastening.

No brushes, blacking, pipeclay, &c., for cleaning purposes should be permitted, each man should have a bit of soap and a towel, and be permitted to carry two yards of rag cloth for cleaning his rifle.

An officer should have 50lbs., and 20lbs. for cooking, total 70lbs. Staff Sergeants and Native Officers 10lbs., for cooking plus 35lbs. carried=45lbs.

In addition to this, which is what they should carry for their own comfort, each man should carry a tool of some sort. The proportion cannot, of course, be rightly determined till the nature of the country they are going to is known, because in a very jungly country a larger proportion of axes and other cutting tools are necessary, in a stony country a larger number of crowbars and picks, and in a level country with ordinary soft soil, more spades and *fowrahs*. To illustrate this, let us take Bhootan as representing the first, the North-Western Frontier Hills the second, and the plains of India, China, or Persia the third; then the proportion should be as follows:

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* As this is the least any man can do with, this scale applies to Natives equally with Europeans, as well as to all branches of the service.

Out of every 200 men—

Kookrees	all	all	all
Fellingaxes...	... 20	5	5
Hand do. ...	... 20	5	5
Spades ...	... 30	40	55
Picks ...	... 25	40	30
Crowbars ...	... 5	10	5

Any other tools necessary for entrenching or road making should be carried by Sappers or with the Engineer Park, and crowbars should be carried turn and turn about throughout the Company.

COOKING POTS.

With regard to cooking pots and eating things, however, advisable it may be to reconcile the shape of these things in use with Native and English Troops, it cannot be done, and, of course, as long as we enlist men whose religious prejudices or caste fancies forbid their eating together, we must not expect to see this very large item of a Native Soldiers' *impedimenta* reduced in any way.

To take then the English Soldier first, he requires one pint drinking cup for all purposes, holding one knife, one fork, one spoon, one small salt and pepper box. He also requires one large-sized tin plate, and cooking pots—

For each mess of 15 men or 20 men—

1 copper boiler, 6 gallons.
1 do, do. 3 do.
1 do. ladle, iron handle.
1 tea-pot.
6 *tawas.*
2 copper trays (*talees*).

These pots should be made to fit into each other, and the tea-pot into the three-gallon boiler, the *tawas* into that, and the *talees* over top and bottom. These are sufficient, and should not weigh more than 40 lbs. Four messes in one Company gives one mule load per Company, or say 3 lbs. per man for messing things.

And with reference to those castes of Native Troops who will cook together, such as Mussulmans and Sikhs, there is not the least necessity for their cooking equipment being more numerous or weighty; but, looking to the fact that they eat less meat, they might have one three-gallon boiler, four *talees* and eight *tawas*, with three smaller pots like *lotas*, four spoons per mess. As to the castes who do not cook together, there is nothing for it but to allow each man one *lota*, one *talee*, one *tawa*, one

spoon ; but there is no doubt that by adopting a uniform pattern, much may be done both to reduce the weight and also to afford easier and less bulky packing, so as not to exceed 3 lbs. per man.

RATIONS.

Inseparable with this question of cooking is that of rations, it is of course, just as advisable that there should be as nearly as possible one scale of rations as one description of cooking utensils ; and if we cannot carry this out entirely, it is still advisable to do so to as great an extent as possible. At present, when on service, rations are issued to Troops ; there are the following scales of rations, *viz.*, European Soldiers, Native fighting men, public followers, private followers, each of which not only differ in amount, but also in description of food.

Now, though they cannot all be quite assimilated, much can be done to get off this surely absurd anomaly. Taking it for granted that in any Force in the field there should be no superfluous mouths to feed, that every man does a fair day's work, and therefore earns a fair day's food, it seems something ridiculous to lay down one man shall get more or get less food than another. Suppose, then we take the English Soldiers' ration as standing alone, there seems no reason why all Natives with a force should not receive the same as follows :

SCALE OF RATIONS PROPOSED.

	English.		*Natives.*	
	lb.	oz.	lb.	oz.
Flour ...	1	...	1	...
Rice ...	1	4	1	4
Salt ...	...	$\frac{2}{3}$	...	$\frac{2}{3}$
Ghee ...	...	2	...	2
Turmeric ...	...	...	...	$\frac{1}{2}$
Sugar ...	...	2	...	2
Meat ...	1	8	1	8
Tea ...	...	$\frac{1}{2}$	...	...
Preserved vegetables, or kokum ...	...	2	...	$\frac{1}{2}$
Total ...	4	$3\frac{1}{6}$	4	$1\frac{2}{3}$

of which, however, only 1-$7\frac{2}{3}$ oz. and 1-$5\frac{1}{3}$ oz. have to be carried.

When Natives do not eat meat, or do not get it, they should get $\frac{1}{2}$ lb. more flour and $\frac{1}{2}$ lb. rice.

It is not likely that these rations would prove more than enough ; it is the safe side to over-feed men in hard work. But of course in case of necessity men can be put on short rations.

SERVANTS.

Inseparable again with the question of rations is that of establishments ; it is hard to say which is the greatest curse to an Army operating in a difficult country, too much baggage, or too many followers.

To begin, then, let no such thing as a lascar or tent-pitcher ever accompany a Force on any plea whatsoever, neither for Officers or men.

There should be no sweepers either, but only one puckaly bheestie, one hand ditto per 100 men, and one cook per mess.

This for the men of all arms, whether European or Native.
For horses, one grass-cutter to every three horses, no syces.
Officers, one servant each, one to each authorized horse.
For Office, Soldier Clerks only to be allowed.
No other followers to be permitted with Regiments or Staff Officers.
On occasion the cooks and bheesties can be left behind.

SICK CARRIAGE.

I now come to the question of sick carriage; and if, with reference to the general nature of the countries in which British Indian Armies have to operate, we allow once for all that no sort of ambulance is fit for the carriage of sick men, that animals are only fit to carry slight cases, and that men are required for serious ones, we shall reduce the question as to the best description of such carriage into very narrow grounds, and there does not seem to be any necessity for arguing these points, they are sufficiently self-evident to call for any proof in their favor.

Let us take then the cases of bad wounds and serious illness first: for these especially, when the patient will not bear moving the dooly is most undoubtedly the best, but the dooly as at present made is a very heavy, cumbersome litter, and hangs a great deal too low for use among mountains.

But it can be improved. A common light Native string charpoy, 6 feet long by 2½ broad, with the legs cut to within 6 inches of the ground, and the side poles made to fit into a loop which goes round the legs, and removeable at pleasure, furnishes us with all we require, *viz.* a light, simple, easily repaired litter. The best shelter from rain is the man's own water-proof sheet stretched over two canes crossed in the manner shown in the sketch, and shelter from the sun can as easily be improvised at the time by the use of the man's blanket. Any attempt to provide beforehand a more secure or permanent shelter only makes it more complicated and cumbersome. This could be carried by four men, and be used as a stretcher for taking wounded men off the field carried by two men. (*Vide* Plate III.)

For slight cases, *i. e.*, a little fever, diarrhœa, slight wounds, or sore feet, common saddles on mules, and double saddles for camels, answer all the requirements.

Taking into consideration that all sick men should be sent to the rear as fast as they become a nuisance from requiring carriage and the services of men to look after them who may be better employed, and also that Regiments have been thoroughly weeded of weakly men before-

2 feet
6 feet
2½ feet
2 feet

hand, the scale in which these should be provided should be as follows, *viz*:—

Litters, 4 per cent. } Of whole force,
Other, 6 per cent. }

Each litter requires four men.

It must not be supposed that the following contrivances for carrying sick men are left out of the above consideration on any other account but their unfitness, *viz.*, Cacolets, Kajawahs, Ambulances, Hammocks, Dandies, Swing Cots, &c., &c. I know of all and have condemned them on their own merits.

In addition to the practical experience I have had of the various methods of carrying wounded men, I visited and paid particular attention to a very large display of all the contrivances for this purpose, which were exhibited in the building set apart for the appliances of Military Hospitals at the Paris Exposition of 1857; yet though there were many which called forth the admiration of visitors by the completeness of their fittings, there was not one which would have stood the rough test of actual war.

DEPARTMENTAL ESTABLISHMENTS.

I will not presume here to lay down in detail the Establishments necessary for the Hospital, Commissariat, and Ordnance Departments on field service; but if the principle that a Regiment should do every thing for itself is acted up to, and if these departments are assisted in absolutely necessary work by parties from Regiments, it is evident that very small establishments only can be necessary.

Firstly, with reference to Hospital Establishments, it would, of course, be most impolitic to curtail in any way that part of them which may be called the skilled portion, those which the Medical Officers may regard as absolutely necessary for the proper treatment of cases: but there is no doubt that a very little practice would enable the Soldiers themselves to assist to a great extent as nurses, watchers and dressers; and if this is the case; it is also preferable on the grounds of "*camaradrie*" and good feeling between men of the Regiment.

Large establishments for Commissariat purposes also do not appear to be necessary, for though here also it will not do to cut down the number of agents of superior intelligence and standing, the troops of coolies, lascars, &c., who always accompany an Indian Commissariat may well be dispensed with.

A plan of requiring every Regiment to have ten days' supply with them was followed with great advantage during the campaign in Abyssinia, and might be applied to other countries. It serves to do away with the number of men required for daily issues, saves accounts, and consequently accountants and renders Regiments more efficient and more ready to move at a moment's notice.

The system at present followed for the check of the issue of rations appears to be unnecessarily cumbersome and inducive of great waste of time, paper, and temper. If a Regiment or Detachment wants its food, the drawer has to go into an elaborate calculation based on the number of men, the description of rations, the number of days for which required, and the issuer has also to go through the same elaborate calculation in order to enable him to check it; and this is not all, if the ration were unvariable, matters would be simplified, but it is not so, sometimes there is no tea, at others no sugar or rum, or else the quantity of some particular item has to be increased or decreased, so that really each day's calculation has to be made out afresh.

What is the good of all this? Such elaboration of check and complication of account must defeat itself. No Commissariat Agent really can check each requisition, he is only supposed to; but if he did, the men would starve. When in addition there are five different sorts of rations for men and ten for animals, the practice becomes more than ludicrous, it resolves itself into a criminal waste of time.

At a race meeting in England, when a vast number of people have to be fed in a short space of time, the proprietors of the refreshment stall do not require indents, nor even relative payment in cash involving calculation and change, but they issue tickets at so much a head. Why then should there not be ration tickets colored according to the description of ration, white for Europeans, red for Natives, green for horses, &c., on presentation of which the whole or such part of ration as was authorised or procurable, should be issued. The idea is feasible. and by a little practice in a cantonment in peace might be made perfect for use in war.

Too much weighing also goes on for service, minute weighing of small quantities is vexatious and productive of very little saving after all. Articles being made up in packages of known quantity and issued bodily as much quantity would not in the long run hurt either the Government or the Soldier.

And with ordnance stores much may be done to lessen establishments without diminishing supervision. To begin with, all the ammunition required by Regiments or Batteries for immediate use should be under its own care, *viz.*, 140 rounds per man, thus doing away with the necessity of a single man other than the Soldier of the Regiment or Battery to look after it. And if at grand depôts working parties of Soldiers were used to store it, and, on the occasi on of an issue, Detachments sent to remove the same, so much would not be said of the neeessity for Troops of store lascars and tindals, &c.

It will be observed that, in treating of this subject of establishments with regard to all the above departments, no proposal is made to reduce the skilled supervision, but only the unskilled labor—labor which costs money, increases numbers, and, worst of all, on a campaign consumes food, when the work they do perform could be more satisfactorily and efficiently done by the Soldiers themselves.

TRANSPORT TRAIN.

The organization of an efficient transport train for the carriage of supplies on a campaign is a subject which is now receiving more attention than heretofore, and rightly so; there is none more important, for, when a transport train breaks down from bad management or other cause, it does not merely mean so many animals galled, so many dead, but also shortness of provisions, insufficient ammunition, few medical comforts; it hints at sickness, disaster, and disorganisation, and it may even cause failure of operation.

The first thing then required is a clear well-considered organization, for though with the best organization there may be difficulty, still without it all the zeal and intelligence in the world is of little avail; and this organization must not be of that ultra description which by the multiplication of rules and forms organizes itself into inefficiency; it must be based on common sense, nurtured by common sense, and kept up by common sense.

Self-interest is after all one of the chiefest mainsprings of successful action, and as with men, so with Regiments, if it is clear that it would be for the interest of a Regiment provided with a transport to keep it in efficient order, it seems folly not so to provide it, for as without its transport a Regiment cannot advance to that fame and glory which the most prosaic of us look to, by giving a Regiment its own train to look after, we surely have as powerful a lever wherewith to ensure its hearty co-operation in its well being as we can well have.

And again though it is in most men's experience to have seen baggage animals carrying much larger loads than will be hereafter detailed as the maximum to be put on to them, it should be remembered that these occasions have been with the favorable concomitants of good roads, abundance of care and not too constant work—whereas on a campaign (and this is more especially the case among mountains) the animals seldom have good food, or much care bestowed on them, their work is constant and never remitting, and they frequently stand for hours together on a narrow path laden and without meat or drink. Therefore, though these loads may appear small, they are such as the experience of Field Service shows cannot be exceeded with impunity.

Taking all this into consideration, a cooly cannot be calculated on as carrying more than 70 lbs. (indeed this is a large estimate, for in Bhootan they seldom carried more than 60 lbs: yet as, if left to themselves, they frequently carry 90 and 100 lbs., it is probable that means might be found to induce them to take any load up to 70 lbs.); an average mule should not be called upon to carry more than 160 lbs., a camel than 320 lbs., a bullock than 130 lbs., a Maltese cart drawn by two mules than 1,000, or an elephant than 1,000 lbs.

This, however, is not meant to govern exceptional cases, for it may be necessary to load them to the last straw, or a long halt on good food

may have so far restored them as to make extra loads not only justifiable but advisable.

With regard to coolies it is better not to interfere with them, as to the method in which loads shall be carried, they are pretty sure to know a good deal more about it than any mere amateur. Therefore, whether they carry on the head or the shoulder, whether by brow band or the chest band, it is only necessary to see that they are provided with new and efficient gear.

For bullocks, it is probable the common Native pad is the best suited form of saddle; but if they are to be used much among mountains, it is also advisable to provide serviceable breast and breech bands as well as ropes to prevent loads from slipping off the pad, in ascending or descending a hill.

The question of the best pack saddle for mules or horses is one which, like that of the best saddle for Cavalry, or of gaiters for Infantry, is never ending, for no sooner does the experience of one campaign seem to decide it than that of the next upsets it and re-opens the whole question Yet, lately, there has been a great deal of experience bearing on this point. Within the last eight years, we have been called on to use mules as pack animals in China, New Zealand, at Ambeyla, and in Bhootan and Abyssinia, and if there is a possibility of opinions founded on the experience of all these being refuted at some future period, we can but do our best.

The campaign in Abyssinia gave very excellent opportunities for considering this question, for here were tried the very latest English inventions, the Otago and MacMahon, against the pads in use from time immemorial in the Punjab, Persia, and Egypt, where practice extending over centuries may be supposed to have given these people some experience of the matter.

Even at the expense of spinning out these already too long notes it will be well if we first consider what should be the chief points in a pack saddle—

1st.—It should not gall; and, to secure this point, the padding must be sufficient, and it must not press on those parts most likely to gall, namely, the shoulder, withers, and backbone.

2nd.—It should be light, because every lb., added to its weight, takes one off the load we can put on the animal, and with this view there should not be too much iron or wood, and nothing superfluous should be permitted.

3rd.—It should be simple and easily repaired, because a saddle that is merely good at the commencement of a campaign, and cannot be easily repaired during its continuance, is evidently unfit.

The Otago saddle is better in theory than in practice; it is light

it appears simple; and it seems to be well raised off the withers; but it must be made of several different sizes to fit every sized animal,—as if it is too large, it slips down to the withers; if it is too small, it presses on the shoulders; and though the beautiful straps with which it is provided seem to an Englishman the perfection of fitness and simplicity, yet to the untutored muleteer accustomed to nothing but rope, they are the acme of complication.

The principle of the MacMahon saddle is the the same as the Otago, but it is extremely heavy, requires careful fitting, and has too complicated straps.

The Hungarian saddle is also the same principle, and has the advantage of being much lighter and furnished with more simple fastenings, but it is dependent on a carefully folded blanket, which is evidently too much to expect from muleteers on dark or cold morning marches.

The Punjab pad is simple and light and affords very fair protection to the back, this being provided for by two rolls of numda which rest on either side of the backbone.

The Persian pad is made on the same principle, it is larger and more clumsy, yet has the advantage of a loin cover.

The reason why the Otago and MacMahon saddles require careful fitting, is because the frame-work is too rigid, and can only adapt itself to the particular animal for which it was prepared, and the reason why, with a number of mules of all sizes, the Punjab pad in Abyssinia galled fewer than ony other, was because it was not rigid enough and adapted itself more readily to different conditions of size, &c.; and again the reason why the Otago did not gall more, was owing to the load being kept so well off the spine by this very rigid frame-work, while the reason why the pad did gall so many as it did, was because it had no tree, which would keep the load from pressing on the spine.

Now, bearing this in mind, and remembering what we have said above on this subject, I will endeavour to construct a saddle which shall be without the disadvantages detailed in the foregoing paragraphs.

In Plate IV., figure 1, is shewn in red ink the outlines of the bones of a mule, and it is evident the points to be more particularly guarded against galls is G, the spinal bones, and H the shoulder blade. In figure 2 an attempt is made to show what a section cut right through a mule's back would be. Here, G being the point to protect, it will be seen that the reason why a mule gets more galled there than elsewhere, is because as the pad formed by the flesh (shaded in red ink J) falls away, the pad of the saddle (shaded in black D) is not sufficient to make up the deficiency, the bones protrude, are pressed on by the saddle insufficiently padded, and the consequence is, a gall.

It is therefore evident that any saddle with only a fixed amount of padding cannot be fit for use equally for animals in and out of condition.

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It is therefore evident that any saddle with only a fixed amount of padding cannot be fit for use equally for animals in and out of condition.

A saddle to be perfect must have, therefore, some contrivance to enable the gap which is caused by hard work and short food in the former well rounded outline of the back of a well conditioned mule to be filled up.

A glance at figure 3 will show how this is proposed to be secured, as well as the general nature of the saddle suggested.

A A A is an iron frame-work fastened to a wooden tree B B which is made in the shape of the tree of a hunting saddle, the advantage of this shape being that it does not press so closely on the back and gives freer play to the shoulder.

C C is a pad of layers of felt to the thickness of an ordinary Punjab pad, it being made originally thicker at D. and each saddle being supplied with one numda to go under all, and three strips of felt to put in at D, so as to render the padding at this point more complete, when the animal has fallen off in condition.

At M M the tree fits into pockets in the pad, but these can be separated and the pad alone left on the animal.

N is the loin carpet taken from the Persian pad, and together with the pad divested of its tree forms of itself a covering of very great warmth for the animal at night.

1 and 2 are straps attached to the centre of the iron frame-work before and behind to prevent in a great measure that swaying of the load which is always so evidently one great cause of galling.

These straps have only one buckle each.

Nos. 3 and 6 are breast and breech straps of soft broad leather to prevent the saddle slipping back and forwards.

And 4 and 5 are girths of the usual material fastened to the pad only to keep it in its place.

It is not supposed that even this saddle, which is made on the most approved principles, would prevent galls unless proper supervision is exercised to see that the straps, &c., are properly adjusted and the load properly fastened on. For no saddle can prevent a badly placed load from causing a gall. In Abyssinia, there was abundant proof of this ; in figure 4 the red lines show a load as the muleteers delighted to place it, dangling within a foot of the ground, swaying backwards and forwards, and catching every projecting stone or branch in the road. The load shown in black ink is the way a load should be put on, *viz.*, high compact and secure.

Though there are so many opportunities in India of gaining experience as to the best description of pad or saddle for camels and elephants little or none has been recorded. Therefore till we are in position to speak more from experience, it is wiser to trust to the attendants who have been accustomed to these animals all their lives. Yet there is no

doubt elephants and camels do gall considerably, and as the osseous structure of these animals is similar, it is evident that unless the saddles provided are made on the same principle as that recommended for mules or horses, they must be faulty and capable of improvement.

When carts are used, as may frequently be the case with great advantage, no effort should be spared to have the Maltese cart, it is just as superior in its way to all country carts as the railway is to the old mail coach, and to use ponderous, awkward hackeries, when light and suitable Maltese carts can be provided, would seem a decided blunder.

There is one more point in connection with transport to be considered, *viz.*, the number of attendants necessary for each animal. The scale should be as follows :—

Bullocks	...	1 man to 5.
Mules or ponies	...	1 „ „ 3.
Camels	...	1 „ „ 3.
Elephants	...	1 „ „ each.
2 Mules or 2 Bullocks, or pony Carts	...	1 „ „ „

These should be organised under regimental arrangements.

I do not pretend that this finishes the subject of transport. Such a question cannot be summarily treated in a short paper like the foregoing, it is one which is worthy of the most careful enquiry. The formation of a nucleus in time of peace, the field organization in war, the care of the animals, the sources of supply, &c., these are all points which would have to be treated of, and regarding which there are many able opinions which would have to be reconciled.

C. M. MACGREGOR, *Lieut.-Col.*,

Bengal Staff Corps.

Short Notes on Professional Subjects.

I. Scheme to promote Recruiting for the Regular Army.

By Major T. LYNDEN BELL.

1. The term of 21 years' service, which at present entitles a Soldier to pension for life, to be divided into three parts, *viz.* seven years five years, and nine years.

2. Soldiers to enlist in the first instance for seven years, on completing which, if of good character and effective, to be permitted to re-engage for five years, or to enter Reserve.

3. After 12 years the same plan to be observed ; but if approved by the Commanding Officer to be permitted on completing 10 years, (say) to re-engage for such a period as may be necessary to complete a total of 21 years' service.

4. That Soldiers of good character, discharged at their own request, on completing their first or second engagements, shall (provided they enter the Reserve, and serve in it for a term the duration of which to be determined by authority) have a right to registry for deferred pension at 4*d.* and 6*d.* a day, respectively, on attaining the age of fifty.

5. That "The National Guard" or "The Home Guard" shall be the terms applied to Reserve and Local Forces, instead of "*Militia*" (which is a most unhappy name for an armed body) and other organizations.

Thus, the Royal Cumberland Militia (say) would be termed—The (number) Battalion of the National (or Home) Guard.

6. That "rations," and everything required to complete the food of the soldier, shall be issued free of charge to every Non-Commissioned Officer and Private serving under the Standard (but that no allowance in lieu shall be given when a man proceeds on furlough). That hospital stoppages shall cease. That such charges as hair-cutting, washing, &c. &c., shall be otherwise provided for than at the expense of the men.

7. That to keep up the supply of regimental necessaries required by ordinary wear and tear, an allowance of one penny per diem shall be admitted for each Non-Commissioned Officer and Soldier. This sum to be in the hands of the Captain of the Company, and the Soldier to acknowledge his debit or credit in his monthly accounts at the conclusion of each military year, any sum to the man's credit beyond 5 shillings to be handed over to him.

Note.—Articles of necessaries made away with or lost by neglect to be made good—by stoppages of pay and allowances, by sentence of Court Martial, or by consent, as at present.

8. That the net pay of Private Soldiers of Infantry shall be fixed

at the clear sum of (6*d.*) per day at Home and in the Colonies, and at (9*d.*) in India.

Note.—These rates can be modified if considered too high.

9. That the net pay of Non-Commissioned Officers (and Soldiers of other Arms) shall be as much in excess of the rates noted in paragraph 7 as they are now higher than the Private's nominal pay.

10. Non-Commissioned Officers and Soldiers admitted to hospital through disease or disability caused by their own vice, or intemperance, or through having wilfully maimed themselves, to draw no net pay while thus non-effective.

11. That, both for simplicity in accounts, and so that careful men may have a better opportunity of investing what they do not require to spend, in the Savings Bank, all Non-Commissioned Officers and men shall be paid weekly.

12. That after having become thoroughly acquainted with his military duties, and having served in the ranks at one inspection by a General Officer (or being accounted fit to do so if sick or otherwise employed), each Non-Commissioned Officer and Private, in his first period of service, be given credit for one penny for each day of "good service," as shown by his record of service dating from above-mentioned inspection, the said money to be termed "reserved pay," and to be paid to him after discharge at "his intended place of residence."

13. Reserve pay at the same rate to be credited to all Non-Commissioned Officers and men in their second or third periods of service, with the option of drawing half the amount of arrears due at the time of completing their former engagements.

14. That the conditions of forfeiture and restoration of reserved pay shall be identical with those affecting good service towards pension.

15. That no Non-Commissioned Officer or Soldier shall be permitted to marry during his first period of service.

16. That Non-Commissioned Officers and Privates may be permitted to marry during their second and third periods of service in such numbers per cent. of each rank as, upon due deliberation, may by authority be considered possible without detriment to the service.

17. That lodging, fuel, light, and a family allowance (similar to that granted in India) or rations in kind, shall be granted to each Soldier's family, and that simple articles of furniture, also bedding, be placed in each married quarter; and further that conveyance at the public expense shall be granted to them from one station to another.

18. That all Private soldiers who have completed 21 years' good service shall have a pension of one shilling a day for life, and in addition one penny per day for each good conduct badge held during the last two years of their service.

19. That Non-Commissioned Officers at the time of discharge who have held rank as such for seven years during their total of 21 years' service shall have a pension equal to the full pay of that rank which has been longest held by them during their seven or more years of Non-Commissioned Officer's service, and provided it is not of a rank higher than that held on discharge.

20. That if discharged with a Corporal's pension they shall have in addition one penny per day for each good conduct badge, which they would have been possessed of for two years prior to discharge had they not been promoted to a higher rank.

Note—The existing good conduct warrant to remain in force excepting in its operation as to pension,—*vide* paragraphs 19, 20 and 21.

21. That pensions for wounds or disability at any period of service shall continue to be regulated by the liberal provisions of the Royal Warrant of July 1864.

22. That every Non-Commissioned Officer and Soldier in his first period of service shall attend the Regimental School until he has learnt to read and write, and until he has a knowledge of the rudiments of Arithmetic.

23. That every Non-Commissioned Officer and Soldier who having completed seven or more years' good service is discharged with a good character, and is in possession of an Educational Certificate from the Regimental School (the qualifications for which to be determined by authority), shall have, so long as he shall not be convicted of any serious breach of the laws, and so long as he shall support himself without assistance from his Parish, a vote for the Parliamentary representation of his Electoral Division.

T. LYNDEN BELL, *Major*,

1st Battalion, 6th Royal Regiment.

RAWUL PINDEE;
The 11th March 1871.

II. Notes on Non-Commissioned Officers' Schools in Prussia.

By Captain E. F. CHAPMAN, R. A.

"The introduction of a short service has given rise to grave doubts regarding the future efficiency of the Non-Commissioned Officers of the Army.

"While Military reformers are engaged in considering the possibility of transferring our Soldiers rapidly from the regular Forces to the reserve, the importance of providing, simultaneously with this change in our system, a supply of Non-Commissioned Officers of superior training and education appears to be overlooked.

"I venture to submit, for consideration, the following notes made during a visit to the Continent in January 1869:

"There are at present three Military schools in Prussia which, during last year, supplied about 350 trained Non-Commissioned Officers to the Infantry of the Army.

One at Potsdam, established in 1824.

One at Julich, established in 1859.

One at Bieberich, established in 1867.

"So highly valued are the qualifications of the young men supplied by these schools, that it is found impossible to meet the demands made upon them, and already it is in contemplation to start two more schools at Weisenfeldts and Marianswerder for the education of Non-Commissioned Officers.

"The first school established, that of Potsdam, was intended to furnish Non-Commissioned Officers to the Guard only, as was that at Julich when first opened, the students were originally sons and orphans of Soldiers. The schools at Julich and Bieberich are now open to all boys from 16 to 20 who can produce the permission of their parents to enter, and obtain a certificate of good conduct from the Magistrate of the District in which they live; candidates are required to be able to read and write a little, and to know something of elementary arithmetic; they remain for two years at the school, when, if they can pass the required standard of examination, they are sent as Non-Commissioned Officers to the different Infantry Regiments of the service. In lieu of the three years' regular service demanded from the Prussian Soldier, they are obliged to serve for six years, and if willing to remain nine years in the service, they are entitled to be recommended for good positions in the Civil branches of Government employ.

"Owing to special qualifications required from Non-Commissioned Officers of Artillery and Cavalry, a different system prevails for these branches of the service: they have special schools at Cassel and Hanover,

where Soldiers selected from the ranks after one year's service to become Non-Commissioned Officers, are educated and returned to their Regiments.

"The Prussian School at Bieberich for Non-Commissioned Officers is divided into four Companies averaging 125 men. The number of Officers for the above is 19—

1 Commandant (Captain with rank of Major).

4 Commanders of companies (usually Lieutenants).

12 Officer Instructors (three per Company).

1 Adjutant.

1 Instructor in Gymnastics.

"The Officer Instructors are appointed by the War Minister in regular course of duty, being relieved every three years: the Commanders of Companies are retained longer if it is thought advisable. The position of Officer Instructor is a popular one, the allowances are liberal and it is considered a compliment to be chosen for the post. In proof of this, I may mention that the larger proportion of the Officers are from the Guard, to which the schools themselves are attached.

"For the general duties of the school and to assist in giving instruction, Non-Commissioned Officers are supplied by Regiments throughout the Army; they are evidently of a superior stamp. Regiments are induced to part with good Non-Commissioned Officers for this purpose by the fact that in exchange for one Non-Commissioned Officer Instructor, they are entitled to receive three young Non-Commissioned Officers from the school. There would appear to be no difficulty in procuring students, or instructors, so popular are these institutions.

"No. 3 Company, which I had an opportunity of inspecting during the hours of study, was divided into three classes, each containing about 40 students, the most advanced of whom were undergoing instruction in Military History and Geography, from Lieutenant———, at the time of my visit; questions on the Campaign of 1813 and on that of Waterloo were answered with correctness and quickness; they were in all cases confined to historical facts and did not bear on the principles of the art of war.

"Each student was provided with a capital set of sheet maps (lithographed in the institution), the details of which he was called upon to fill in himself, while the geographical questions put by the instructor directed his attention to important points. It is worthy of notice that the instruction in geography was chiefly that of the Military divisions of Germany, the German frontier roads, &c.

"The second class was engaged with the elementary part of Military drawing, preparatory to making eye sketches of the neighbouring country, when the season advanced. I thought the students intelligent

and saw some sketches made during the summer by a more advanced class which were very creditable and sufficiently accurate for Military purposes.

" The third class, under a Non-Commissioned Officer Instructor, were employed in reading, writing, and recitation.

" The studies continued from 9 to 11-30 when I saw the Company at drill for half an hour ; I then visited the gymnasium where the attention given to the bayonet exercise seemed to prove that the Prussians had not adopted the opinion that breech-loading arms are likely to put an end to the style of fighting most popular with the British Soldier.

" The following weekly programme for the most advanced class gives some idea of the education imparted and of the hours apportioned to study :

Hours	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
8-9	Marching out and Instruction in Field service.	Manual and Platoon	Practical Instructions in Field duties.	Gymnastics.	Gymnastics.	Reading.
9-10		Writing.		Arithmetic.	Drill.	Writing.
10-11		Reading.		Official Correspondence.	Ditto.	Theoretical Instruction.
11-12		Geography and History.		Writing.	Ditto.	Gymnastics.
2-3	Arithmetic.	Drill.	Cleaning Quarters.	Drill	History and Geography.	Cleaning Quarters.
3-4	Official Correspondence.	Ditto.	Drill.	Ditto.	Religious Instructions.	
5-6	Tailoring.	Singing.	Choir Singing.	Cleaning Arms.	Preparation of Lessons.	Choir.
	Preparation Study.	Cleaning Arms, &c.	Theoretical instruction	Preparation. of Lessons.	Singing.	Cleaning Arms, &c.

" For the supply of clothing, boots, &c., the establishment is made independent by capital workshops, the work is performed by non-combatants of the Military District in which the School is situated.

" I visited the barracks, kitchen, &c., store-rooms. Two Companies were route-marching on the morning of my visit, and one Company was employed in drill and gymnastics.

" An impression of hard-work and interest on the part of Officers and Students could not fail to be received ; the same attention to details could not be expected as is demanded in a purely Military life ; but if something of smartness was sacrificed, there was an air of comfort in the Prussian Non-Commissioned Officers' School barrack particularly pleasant.

" Special qualifications are required in the Officers and Non-Commissioned Officers of an Army receiving yearly so large a number of recruits as the Prussian Army ; the system demands that all should be able to impart whatever knowledge of the Military art they possess with facility. It is from the Officer that the Non-Commissioned Officer receives all the training he possesses ; and the education of the Non-Commissioned Officers and Soldiers has an interest for each individual Officer which our system fails to impart, while the benefit to the Officer himself in demanding self-cultivation is very great. It is recognized that one-half of the Soldiers in the Prussian Army can read and write, while the fact that a Non-Commissioned Officer is rarely deprived of his rank as compared with the numerous Courts Martial held in our service is an evidence of the high character and capabilities of the men employed in the Non-Commissioned ranks in Prussia. In the Prussian Military School a sound practical education is bestowed, at a comparatively small expense, upon a body of men, whose services are of great importance to the State, during their Military career, at the conclusion of which they possess special qualification for further usefulness in responsible positions, either as Civilians or Soldiers."

E. F. CHAPMAN, *Captain,*

Royal Artillery.

CORRESPONDENCE.

I.

To

THE COUNCIL OF THE
UNITED SERVICE INSTITUTION OF INDIA.

GENTLEMEN,

I WISH to address a few words to you on the subject of the advisability of affording Officers of the Army in India greater facilities for attending the course of instruction at the Royal Military College, Sandhurst.

I am not prepared to state explicitly what I would recommend to this end, but I am speaking the feelings of great number of Officers of the Indian Army when I say I do not think the present arrangements are adequate.

As the matter stands at present, the Officers of the Home Army have an advantage over their comrades of the Indian Army. The former can and do attend the College, and are consequently more able to make themselves efficient than the latter, especially, too, as in India there are not even opportunities of private study.

It is such a well recognised fact now that the education of Staff Officers is absolutely necessary to the success of an Army in the Field, that any arguments I may urge in favor of my views would be but a recapitulation of those which are in every one's mouth; and, therefore taking it for granted that it is necessary, it surely cannot be supposed that it can be dispensed with in India any more than elsewhere.

I am quite opposed to any idea of a Military College being established out here; to my mind the objections to it are—1*st*, unnecessary expense; 2*nd*, the danger of an Indian College Certificate not carrying with it the same weight as one of the Sandhurst College; 3*rd*, the very great objection that exists to further disconnecting Officers serving Her Majesty at Home and in India. I think, therefore, what I should propose would be that Officers should be required to pass a preliminary examination or undergo a course of six months at Roorkee, and then be sent Home, their passage being paid and being allowed English pay while there; and the Indian Government paying its share of the College expenses. If it was considered an honor to be permitted to go, and none but Officers of proved zeal and ability were sent, the result to Indian Officers no less than to the Indian Government, would be enormous. The number of Officers now permitted to join from the Home Army is . I would, therefore, suggest that at least Officers from the Indian Army be permitted to join annually. Perhaps, the Council of the Institution may be able so far to improve on the above as to render it acceptable to the Government. I am sure their efforts would be appreciated by their brother Officers of the Indian Army.

Yours obediently,
C. M. MACGREGOR, *Lieut. Colonel*,
Bengal Staff Corps.

II.

GENTLEMEN,

ONE can scarcely open a file of General Orders without noticing the number of Officers who are granted leave during the summer season; of this number, the majority no doubt seek the rest and pleasure afforded by the many hill stations; others, however, prefer wandering through the interior, gun or rod in hand, in search of game or scenery, and these, in the course of their rambles, acquire much information, and take notes of many facts and circumstances both novel and interesting.

Some few on their return have published the result of their travels, but it is not to be expected that all would do so; the expense of publication, a natural diffidence to appear before a criticising public, and, in many, a mistrust of their abilities, tend to prevent it. Yet, does it not seem a matter of regret that much valuable information should be buried in the forgotten note books of travellers, rather than brought to light to add to the store of knowledge we already possess regarding the country, or to be of use to the Government in the event of military operations taking place, when the smallest item of information has its value.

Lately, on reading an essay on the organisation of the Prussian army, I remarked that a system had been introduced, and found to succeed, of encouraging Officers to acquire information of all kinds regarding the countries they visited when on leave, more particularly of those adjacent to Germany, and embodying all so required in a report for the information of the War Department; rewards and indulgences being given to those who displayed the greater skill in the acquisition of intelligence.

Could not something of a similar nature be done in India? I offer as a suggestion that Officers be requested on their return from leave to submit a report to head-quarters compiled from their journals, noting all prominent facts that may have come under their observation, and enlarging on those that they may have found deserving of closer attention and study. The inducement to take careful notes and compile a good report, being, in the case of Officers of the British service, an additional grant of leave during the next season, and to Officers of the Indian service a restoration of the service forfeited during the leave; the amount of leave to be granted, or service restored, depending on the excellence of the reports.

I think there can be little doubt but that good would come from this measure: so varied are the talents and inclination of the Officers of the army, that there is scarcely a subject, professional, scientific, or general which would not be touched upon and in which something hitherto unknown would not be brought to public notice; an impulse and a direction would be given to an Officer's studies; habits of reflection and observation would be encouraged: a greater interest taken in the country

and its inhabitants; and no small amount of practice would be gained in the preparation of creditable reports.

My letter, already longer than it should be, must not be concluded without containing one fact to support its reasoning. Ranikhet, already poetically described as the Queen of Hill Stations and the dangerous rival of Simla, has been recently purchased from a late brother Officer of mine for a considerable sum of money, and though known to hundreds of Officers who had encamped under its *cheer* pines, or shot over its undulating slopes, it was left to a retired Subaltern to select for his tea estate the site of the future largest Hill Station in India, and to purchase it almost for a trifle. Now, had this hill been reported upon, as it would have been under the system I have suggested, by some of the many wanderers who crossed it in their rambles, the attention of the military authorities would have been forcibly directed to it, its great natural advantages for a sanitarium would have been appreciated, and a saving effected in the military estimates of, at least, three lakhs of Rupees.

I remain,

SIR,

Very faithfully yours,

ARTHUR CROOKSHANK, *Captain,*

32nd Pioneers.

SIMLA;
The 30th April 1871.

ORIGINAL PAPERS.

I.

On the Officering of Native Infantry, together with a proposed plan for re-establishing a Regimental Organization.

In addition to the grave objections to the Staff Corps organization as affecting the finances of the State, it is generally considered that the present system of Officering the Native Army, from it, is very defective, for the following reasons :—

There are not enough Officers, particularly in the grades of Captain and Lieutenant with Regiments, either to lead the men on service, or to look after them, properly, in quarters.

The changes are necessarily so great, and so constant, that it is impossible for the Officers and men to know each other, as they should.

The present system is distasteful to the majority of the Officers. It does not admit of that proper *esprit-de-corps* which is so essential to the well-being of a Regiment and an Army. There are too few Officers to admit of comfortable and economical institutions, such as Mess, Book Club, Band, &c., being established ; all of which, when properly conducted, add so much to the comfort and respectability of a Corps.

Under the present system Officers do not feel certain of regularly succeeding to the higher appointments in Regiments, which the organization alone should secure to deserving Regimental Officers as their undoubted right ; many of the older Officers are also heavy losers for want of a Regimental purchase or bonus fund which cannot be established.

The advocates of the present system, if any now remain, pointed to the irregular system of the old army, which was certainly good, but they overlooked or forgot, the great difference that really exists between the two systems ; under the old irregular system the European Officers were, every one of them, *selected from a large and experienced body*, whereas such is not, and never can be, the case under the present system. These selected Officers also remained under a Regimental organization, from which they reaped any benefit that was available in quick promotion from purchase, or in retiring with a bonus, and at times they often rejoined to command.

The present Staff Corps system of promoting every Officer after so many years' service, is by no means satisfactory to many of the best Officers in the service, who have been heavily superseded ; Officers who by service in the field, good luck, or purchase, have gained quick promotion, and any system that puts a stop to such occasional quick promotion is certainly not advantageous either to the army or the State.

The Native Officers of the old Irregulars were also considered a superior class of men to the ordinary Native Officer of the present day, but under any system of appointment, or promotion, Native Officers will not look to the discipline, instruction and interior economy of a Regiment as these important duties should be looked to, as they can only be attended to. by a set of contented and efficient European Officers.

Under the present system the majority of the European Officers are discontented, and there are not enough of them to secure proper efficiency; no adequate number of young Officers are undergoing training, so that, practically, the present Staff Corps system is totally unsuited to the well-being of the service.

Were the Government to establish a Regimental Organization on some such plan as the following, it is believed that it would be found to answer well, not only for the army, but also for the future financial prospects of the State.

Each Regiment of Native Infantry, of the present strength in Native Officers, Non-Commissioned Officers and Men, to have a complement of European Officers, as follows :—

1 Lieut. Colonel (Commandant)	1 Adjutant
2 Majors (Wing Officers).	1 Quartermaster
4 Captains } to command companies	1 Medical Officer
4 Subalterns } and not be mounted	TOTAL..... 14

The Officers of two Regiments, as 1st and 2nd Battalions, to be enrolled, according to dates of commissions, in one list, on which only they would get promotion as vacancies occurred, by deaths, transfer, or retirement.

Old, or full batta, rates of Regimental Pay to be reverted to, and staff salaries allowed as follows :—

Commandant.....	Rs. 400.	Subalterns	Rs. 100 each.
Majors	„ 200 each.	Adjutant	„ 200
Captains ...	„ 150 each.	Quartermaster ...	„ 150

Mounted Officers to draw the usual horse allowance in addition.

The present allowance for repairs of arms, and for writing, to be divided between the Captains, who under the Majors, would be responsible for the arms, clothing, books &c., &c.,

Volunteers for the new Regimental organization to be called for and restricted to the following classes of Officers, *viz* :—

1. All Officers whether Staff Corps, or General List, now serving with, or on leave from, Infantry Regiments.

2. All unemployed Infantry Officers, whatsoever, below the rank of Colonel.

3. Officers of less than three years' service, belonging to any of Her Majesty's Line Regiments now serving in India.

Officers Volunteering to join the new organization to give up the Staff Corps, and all claim to promotion, retiring pension, and Colonel's allowances, under its rules, and to revert to the old retiring pension rules of 1796 and 1835-7.

A fixed number of Colonel's allowances, one for each Corps of two Battalions, or for every twenty-six combatant Officers, to be established for the new organization. This List to be completed, in the first instance, by appointing to it the senior Colonels of the new Regiments, on such dates as those Officers would have become entitled to this allowance had they remained in the Staff Corps; and thereafter to be kept complete, as vacancies occur in it, by the appointment of the seniors from a general list of Colonels belonging to the new organization.

Such Volunteers from the Unemployed List as His Excellency the Commander-in-Chief may not consider fit to hold appointments in the new Regiments, to be however posted to Regiments, as Supernumerary of their rank.

This arrangement not to interfere with the future promotion of such Officers when their turn may come on the Regimental list, or with the other Officers below them, who will be promoted as if there was no Supernumerary.

Supernumerary Officers to remain as such, if His Excellency the Commander-in-Chief sees fit, in any advanced rank they may obtain, up to the rank of Colonel, when, if not fit for command, they would revert to General duty, or be permitted to reside where they liked, on unemployed pay.

Supenumerary Officers to suceed to Colonel's allowances, under the Staff Corps rules.

It is not anticipated that more than a dozen of such supernumerary Officers of the Bengal Army, would join the new organization, on the terms here held out to them.

Officers on Civil or detached Employ, or serving in Departments, or Appointments, except such as can *now* be held *without* joining the Staff Corps, to be ineligible for Regimental appointments, under the new organization.

Regimental Officers hereafter accepting appointments, that cannot now be held without joining the Staff Corps, to join the Staff Corps, and to cause a permanent vacancy and corresponding promotion in the Regiment they leave.

All Regimental appointments vacated, either permanently or temporarily, to be filled up in the Regiment, and except in the case of an Officer absent on *privilege* leave, the Officer doing the duty to receive the full salary of the appointment.

Regimental Officers to be allowed leave, with retention of appointments, in, or out of, India. When on leave in India to be allowed full Regimental pay. When on leave out of India, to be allowed two-thirds only of Regimental pay.

There can be no better school than Her Majesty's Line Regiments, for the first two years' training of a young Officer intended for the Native Army, but he should not be allowed to remain longer than two years with a Line Regiment, nor should he be attached to it except as a Cadet for the Indian Army, being gazetted with the temporary rank of Ensign. After two years' duty with a Line Regiment, he should be posted to a Native Regiment and gazetted as a Lieutenant, but he should not get any *appointment* or be allowed any staff pay, until he passes in the languages.

By the introduction of such an organization, the Staff Corps, with its system of promoting superflous Field Officers would be reduced at once to ordinary limits. It would still be retained for a proper purpose, without in any way interfering with the efficiency of the Army, which would also still supply its quota of the General, Divisional, Brigade and Personal Staff.

Such a Regimental organization should be applied to the whole Native army of India, including the Punjab frontier, and all contingent forces.

The Indian Army should be recruited for, and generally maintained in five grand divisions, corresponding to the several Governments, as follows:—

1st, or Northern, "*The Punjab.*" 2nd, or Central, "*The N. W Provinces.*" 3rd, or Southern, "*Madras.*" 4th, or Western, "*Bombay.*" 5th, or Eastern, "*Bengal.*" Each Grand Division to be commanded by a Lieutenant General under the one Commander-in-Chief in India. The men to be enlisted for General Service, and employed on such whenever required

G. HUNTER THOMPSON, LIEUT. COL.
Commanding 19th Regt. P. N. I.

II.

On the Constitution, Equipment, Pay, &c., of the Bengal Native Infantry, with suggestions for reform,

THE Bengal Native Infantry is at present composed of nearly every class and caste of natives from Peshawur to Assam. It is true that the present recruiting regulations prohibit the entertainment of the inferior classes, still many of the regiments require a deal of weeding, and the army would be a far more serviceable one, were its ranks confined to the following classes, *viz.* Puthans, Sikhs, Punjabee Mussulmen, Ghoorkas, and Rajpoots.

There should be a certain number of regiments of each class, in proportion to the numbers of each class, each regiment to consist of eight companies of the following strength, *viz* 1 Subadar, 1 Jemadar, 5 Havildars, 8 Naicks, 2 Buglers or Drummers, 2 Musicians, 80 Sepoys. Total of all ranks, 792.

Class regiments would give less trouble, and be found to answer better in many ways than the present system of mixing different classes in each regiment.

At present there is often great difficulty in regulatiug promotion to the Native Commissioned and Non-Commissioned grades, so as to maintain a due proportion of each class in each grade.

It is also admitted by most thinking and experienced officers, that class regiments are very advisable on political grounds. Our present system tends very strongly to blend the national feelings and prejudices of the different races or classes, which from a military point of view is certainly not to our advantage.

As regards the Native Officers, in order to obtain really good and efficient men, one half of them should be selected from the ranks, and promoted without any reference to standing, or length of service ; and the other half should, if possible, enter as cadets from among the sons of influential and respectable zemindars. If these latter were not well reported on after a year of probation, during which time they would simply be learning their drill and duty, they should be struck off and sent back to their homes,

At sickly stations, or where the duties are very heavy, the present strength of regiments, particularly in Naicks and Sepoys, is not quite sufficient to secure the duty being properly performed.

Every regiment should be allowed a band and band allowance.

Breech loading arms with corresponding accoutrements should be supplied to the Native Infantry. The pouch and ball bag, for the old musket are not suitable to the breech loading, or Enfield ammunition.

With slight changes, so as to secure the proper " Zouave" pattern

tunic, knickerbockers and gaiters, the present dress of the Native Infantry would be both appropriate and picturesque. Red tunic, blue serge knickerbockers and brown leather gaiters for winter. "Khakee" coloured drill articles of exactly the same patterns as the winter clothing for summer. Short ancle, country made, brown leather boots to be always worn. "Pugree" of the same colour as facings. The great coat should be a short one, reaching only to the knee, of the "Inverness Cape" or "Raglan" pattern, made of good country blanket. Each man should be supplied with a loose "khakee" jumper made of drill to be worn over the red tunic when on winter service.

The Government should supply the men with all the ordinary articles of winter clothing, *viz.* great coat, once every five years; tunic, serge knickerbockers, and leather gaiters, bi-ennially; boots yearly,

The unitorm of all the regiments should be of exactly the same colours and patterns, numbers, and facings, being the only distinguishing marks of each.

The present rates of pay for the native ranks, from sepoy to Jemadar inclusive, are too low to secure the best men. With the present and increasing facility of transit, the export demand has largely increased. This has raised the bazaar prices, and improved the condition of the cultivating classes, so that it pays a man far better to remain at his home, and to cultivate his lands, than to take service in the Army on the present rate of pay.

The lowest pay of a sepoy should be Rs. 9 a month; that of a Naick Rs. 12; Havildar Rs. 15 and that of a Jemadar, 1st class Rs. 45; second class Rs. 40.

Good conduct pay at the rate of Re. 1 a month after five years and Rs. 2 a month after eight years, should also be allowed. With the above rates of pay no compensation for dearness of provisions would be required.

The powers of discharge given to Commanding Officers, under Art. 3 of the Articles of War for the Native Troops of 1863 should be restored. The repeal of this article has injuriously affected the discipline of the Native Army.

The question of reform in the present system of officering the Native Infantry, and in the organization of the Native Army, generally, seems now to be reduced to one of simple expediency.

It has been clearly proved on service, that there are not sufficient European Officers with the regiments, and as there is now no longer a "reserve of officers" to draw upon, in case of war, why not apply common sense to the efficient realization of a good object, and correct errors by the experience of the past.

To maintain an army organization that military public opinion headed by such men as the late lamented Sir Henry Durand has pro-

nounced most defective is to court disaster. Therefore to pension off the unemployed European officers, and to establish an efficient regimental organization would seem to accord in every way, with the best interests of the Indian Empire.

G. HUNTER THOMPSON, *Lieut.-Col.*,
Offg. Commdt. 19th P. N. I,

III.

Royal Artillery Organisation and Retirement.

In the Proceedings of the R. A Institution for November 1870 there appears a scheme by Captain Oldfield, proposing several changes in the present constitution of that Service. I propose to test the practicability and advisability of the suggestions made by him. To do so, it will be necessary to enter very fully into details, and to criticise somewhat freely the administration or rather working of the Artillery Service since the introduction of a measure for the eventual amalgamation of the Royal and Indian Regiments of Artillery.

Captain Oldfield observes, "there appears to be a wide-spread feeling that before long the above subject will have to be taken up by those in power," in this expression many who have practical knowledge of the present system which obtains in the Artillery Service will concur. To some it may seem a matter of duty to assist in arriving at a right solution of a question affecting as it does a special branch of the British Army. A service which has grown to greater importance from the events of the war, just concluded, on the fair fertile plains of unhappy France. "The whole of the Artilleries should be amalgamated" says Captain Oldfield, there may be and are differences of opinion on this point, but there can be none as to the intention of carrying out such a measure on the the part of those by whom this question must have been considered before it was definitely decided that such should be.

As a first step towards its accomplishment, Dispatch No. 29 of 18th January 1861 from the Secretary of State for India, states, "that in order to "carry out this measure to the full extent, the organisation of Indian regi- "ments of Artillery will be assimilated to that of the R. A. The Bengal Artillery will be formed into seven brigades, the Madras Artillery into four, and the Bombay Artillery into three brigades, in all fourteen brigades with a "strength of officers detailed in the margin, which is believed to be the "establishment of a brigade of Royal Artillery".

1 Colonel Commandant.	
2 Colonels.	4 Lieutenant Colonels.
8 Captains.	9 2nd Captains.
24 Lieutenants.	

"The assimilation of the Indian with the R. A. will involve consi- "derable alterations of rank. Thus in Bengal seven of the Colonels will "become Colonels Commandant, nine Lieutenant Colonels will become "Colonels, thirteen Captains will become Lieut.-Colonels and 3 captains "and 9 second captains will become supernumerary. This will cause "a stoppage of promotion in the grades of second Captain and Lieutenant. "But there are at present four Lieutenant Colonels, four Captains and "nine second Captains in the Ordnance department, and these being "seconded * * * * will more than compensate for the absorption "of the three Captains and nine second Captains above mentioned." The first measure of assimilation was undoubtedly beneficial to those officers who came within the reach of its action, but it was only temporarily

beneficial to the regiment at large. The advantage to the Regiment or the Artillery Service is the subject of our present paper, and not the benefits derived by individual officers, however remotely or intimately the prospects of personal advancement may be connected with the efficiency of any particular branch of the Service. It will be necessary to exclude all thoughts of personal benefit, and to confine my remarks to the effect on the regiment generally of any measure which may come under observation to illustrate the object proposed by this paper.

Well, the effect of the first measure was to raise the standard of efficiency in respect of service and position to the subjoined level. In speaking of a standard of efficiency, it is usual to institute comparisons between different branches of the Service. This comparison will be more intelligible if the Royal Artillery is selected as the standard, for it will be conceded without question that the standard of efficiency desirable for one Brigade or regiment is equally desirable for another having exactly the same duties to fulfil towards the State. The service of the Juniors of grades on or about the 18th February 1861 was as follows:—

Junior Colonel	R. A.	...	24 years	6 months
Ditto	B. A.	...	32 „	10 „
Do. Lieut. Col.	R. A.	...	20 „	3 „
Do. do.	B. A.	...	20 „	4 „
Do. Captain	R. A.	...	13 „	2 „
Do. do,	B. A.	...	16 „	4 „
Do. 2nd Capt.	R. A.	...	7 „	2 „
Do. do.	B. A.	...	8 „	9 „

Here with the exception of the Colonel and first captains, the two regiments were physically capable of rendering the same amount of service to the State.

The question of Artillery efficiency has been more than once of late years the subject of inquiry before a Board of Royal Commissioners. At a very recent inquiry as to the state of promotion, &c., of the Seniority Corps, the following questions and replies are recorded:—

Q. 43. Practically you are running together as fairly as possible?

A. Yes, very fairly indeed.

Q. 51. * * * * There is no apprehension there will be a block in the Indian Artillery?

A. No.

A pamphlet now before me, which, although published anonymously bears the impress of truth and fairness in all it states, has the following remark:—

"With reference to these replies, I attach a list showing the length of of service of the senior officers on each list on the 1st December, 1870:

	Royal Artillery. Years' Service.	Late Bengal. Years' Service.	Late Madras. Years' Service.	Late Bombay. Years' Service
Senior Colonel ...	38	$42\frac{5}{12}$	$44\frac{5}{12}$	39
„ Lieut.-Colonel	$28\frac{11}{12}$	32	31_{12}	$28\frac{5}{12}$
„ Captain ...	24	$26\frac{5}{12}$	$25\frac{5}{12}$	25
Second Captain ...	$16\frac{8}{12}$	$17\frac{5}{12}$	$16\frac{5}{12}$	16
Subaltern ...	$13\frac{2}{12}$	$12\frac{5}{12}$	$12\frac{5}{12}$	$12\frac{5}{12}$"

It must be admitted, from the showing above, that the rates of promotion can hardly be called running "fairly together."

The senior colonels on the Bengal list have $4\frac{1}{2}$, and Madras $6\frac{1}{2}$ years longer service than the Royal. Nearly the same difference exists in the lieutenant colonels, The captains approach more nearly, but still those on the Royal list have the advantage. The subalterns on the Royal list are at a slight disadvantage.

As regards the prospect of a " block," which General Gambier considers " not likely," in the Indian Artillery. I refer to the last *Army List*, where it will be seen that no lieutenant-colonel of the Bengal list has been promoted for more than 3 years while on the Royal list 18 have been promoted in that period. The Madras list have been fortunate lately, having purchased out several officers ; but their senior lieutenant-colonel has $2\frac{1}{2}$ years' longer service than the Royal Artillery of the same standing. On the Bombay list, no lieutenant-colonel has been promoted for upwards of a year, during which period seven of these officers of the Royal Artillery have obtained the advanced rank.

I would further instance, to show what chances of a "block" obtain, that there are 27 captains on the Bengal list, 11 on the Madras, and 4, on Bombay, who have longer service than the junior lieutenant-colonel of the old Royal Artillery ; also that the senior captain of the Bengal list entered the service before 46 lieutenant-colonels on the Royal list who have thus passed over him.

Thus far I have shown that, as regards rates of promotion, the Royal and Indian lists can hardly be said to be " running fairly" together, and further, that a serious " block" already exists in the Indian list.

It will be observed that the standard of physical efficiency has deteriorated both in the Royal and Bengal list since February 1861 to a greater or less degree in the several grades. The next point for consideration is to trace the causes which have led to this lowering of the standard. To do this thoroughly, it will be necessary to animadvert on certain measures which have been resorted to from time to time, either from motives of necessity, expediency, or uniformity. And first with reference to what has been done for the Royal List. It would appear that in 1866, and again in 1869, the parliamentary grant-in-aid of retirements amongst regimental Colonels having completed 30 years' service was increased, whereby the efficiency of the senior grades has been maintained at a reasonable standard ; the services of the Lieutenant Colonel and Captain last promoted being just over 29, and just under 24 years respectively. But these grants-in-aid of retirements have failed to maintain the desired

efficiency in the subaltern grade. In 1861, the service of the senior subaltern was just over seven years. Now it is more than thirteen. This state of things has however been owing to the large batches of admissions into the R. A., during and subsequent to the Crimean War. It might have been alleviated in some measure by applying the sums of £600 not taken up by Regimental Colonels to the purchase of the retirement of officers below that grade, but it seems that the senior officers have a lien on this grant, I think it cannot be alienated.

Now, let it be seen what has been done for the officers of the Bengal Artillery. It will be observed by Dispatch No. 29 of 18th January 1861 that the Secretary of State displays some solicitude as to the promotion prospects of the officers by the introduction of the first measure of assimilation, in all subsequent measures there is a marked absence or disregard to their prospects, or it may be that the supposed immense advantages which accrued to the Indian Artilleries preclude the possibility of any injury being done to them. In 1863, the Secretary of State offered to Colonels of the Bengal Artillery seven annuities of £200 each in addition to pension, of these, three were taken up, two by seconded Colonels, and one by an effective Colonel.

In 1865, considerable promotion followed on seconding several officers on staff employment or removing them into the Staff Corps. The Subalterns getting as many as 14 steps. In July 1867, Colonel Dickens who had been absent from regimental duty since 1850 was brought back on the effective strength in accordance with the provisions of G. O. No. 516 of 21st June 1864.

In reference to officers absent from regimental duty, the following has been laid down : " His Royal Highness has informed me that it is " very desirable that, as a rule, Artillery officers should not be employed " in other than strictly regimental duties beyond ten years, and that as " there are obvious reasons why it would be disadvantageous *to the* " *interests of the service* to perpetuate a system by which officers, who " as subalterns and captains may have been engaged in miscellaneous " duties for an indefinite period of years, may return to their regiment as " field officers to exercise superior commands with the duties of which " they would necessarily have very little acquaintance.

" His Royal Highness conceives that the fact of such employment " being connected with the Ordnance Department does not lessen that " objection," See Secretary of State's Dispatch November 30th 1866 G.O. March 14, 1867, No. 296.

" All Artillery Officers, whether placed on the seconded list or not " who have been detached from their regiment for less than 10 years to " be informed that they must return to regimental duty within that " period, and that their employment on the Staff will not be prolonged " beyond that period,"—Dispatch of Secretary of State, December 30th 1865, No. 391.

On this question being submitted to his Royal Highness, it was

ruled that as Colonel Dickens' appointment was a *quasi* military appointment, his re-absorption into the effective strength of regimental Colonels was right and proper, Colonel Dickens still holds the appointment of a Secretary to the Government of India, D. P. Works, where his services have been invaluable and duly recognised by the Government.

In March 1868, on Colonel Whistler's promotion to Major General by a casualty in the Indian List of General Officers in accordance with the practice which had obtained from time immemorial and, which practice since has regulated to a great extent promotion in the several Indian Artillery Regiments would appear to have been guaranteed by Acts 21, 22 Victoria Cap. 146 on transferring Military Officers of the East Indian Company to the Crown, guaranteeing the same advantages of promotion, as if they had remained in the East Indian Company's service, the separate List was formed, that is the Generals of Indian Artillery were placed on a list distinct from those of the Indian Army, their number hitherto unlimited, was fixed at 26, the excess was to be absorbed one in every three casualties. I take the following from a pamphlet which I have already quoted above.

" With regard to the promotion of the officers of Indian Artillery " to the rank of Major-Generals, the Commission (assembled to inquire " into grievances of Indian officers) declared themselves unable to deter- " mine the effect produced by the warrant of January, 1862, upon the " prospects which such of their officers as were not Colonels before amal- " gamation would have of becoming Major Generals ; but they state " that the change will ultimately, to a small extent, be beneficial to " the Ordnance Corps."

The Commission then went on to recommend the formation of a separate list although, as above acknowledged, they were uncertain what would be the result.

The Indian Artillery Colonels were thus removed from the Indian gradation list, and formed into a distinct establishment.

To show the amount of injury received from this measure, I quote the following from the evidence given by Major-General Sir G. Balfour before the Committee appointed to enquire into the question of the supersession of colonels of H. M. British Army by colonels of the Indian Army, which assembled in the beginning of this year :—

" According to Hart's Army List, no less than eighteen Indian " Artillery officers have been superseded in the rank of Major-General " by Staff Corps and Indian Army Colonels, although they had prior " dates of commission in the latter rank.

" Had these eighteen Colonels of Indian Artillery remained on the " Indian gradation list, they would ere this have succeeded to the rank " of Major-General, and would then have vacated their regimental posti " tion, the regimental vacancies being filled up by promotions in the res-

" pective corps. The pecuniary loss sustained by the regimental officers " of Indian Artillery in consequence of being deprived of these promo- " tions to the grade of General, may be calculated at £15,000 per " annum. Another loss that must be sustained by the regimental officers " whose advancement is thus delayed before these eighteen officers vacate " their positions in the regiment in consequence of promotion to the " rank of Major General, must be very considerable in a long course of " years."

Colonel Adye, C.B., also in his evidence before the same Commission, states :—" The Warrant of 1864 did not contemplate that in 1868 the Infantry and Cavalry Colonels of the Indian Army should be separate from the Indian Artillery and Engineers, giving the former an *enormous advantage over the latter,* who are now *suffering severely* in consequence." And he further states, in answer to another question on the same subject put to him : " It was a *wrong done* absolutely *to the Indian Artillery.*"

The operation of this " Separate List" has been more injurious to us than any other measure resulting from amalgamation.

These preliminary details bring us to the present state of the regiments which it is proposed to amalgamate. I will now proceed to apply Captain Oldfield's suggestions, but before doing so some apology I consider is due from me for the lengthy detail and apparently irrelevant matter which has been brought under observation. My object in doing so is to show the necessity for some change, either partial or radical, in the present organisation of the Artillery service. And this I hope I have succeeded in doing in the details I have entered into.

From the subjoined tabular statement " A" it will be possible to arrive at a fair understanding of the effect on the Artillery service taken as a whole by submitting it to the process proposed by Captain Oldfield. It gives the following result :—

1. That for a sum of £30,450 a year the Artillery amalgamation can be accomplished within six months.

2. That the heavy outlay for supernumerary officers now incurred by the system of " seconding" is got rid of.

3. That a surplus of 225 Officers (2nd Captains and Lieutenants) is available for the Militia, Volunteers and Local Indian Artillery.

Let us consider these points. First, the Indian Government has just been saved the cost of (5) five Horse Artillery Batteries. Assume the annual cost of one to be £25,000. Here then are the ways and means of putting our Artillery service into shape, of moulding it into the organisation which it is to assume eventually. The Home Government propose an outlay of eight millions to abolish a system which stops the way to all reform in the British purchase Regiments. This amount at 3 per cent. represents an annual expenditure of £240,000. Can

therefore one-eighth of this last sum be considered too heavy a cost to remove the delay which attends the organization of the Artillery service.

2. Captain Oldfield proposes that there shall be no supernumerary Officers. Here I disagree with him, it bars the Artillery Officer from Staff employment. Who can tell, whether there may not be a Henry Lawrence, a James Abbott, a Shakespeare, a Cautley and an Everest amongst the young officers of the present day in the Royal Artillery. I would allow a fair field for the development of " specialities." All who pass through Woolwich into the Artillery are, it may be fairly assumed, well-educated gentlemen, who after having mastered the mysteries of regimental duty may, in many instances, turn their leisure and their minds to more congenial pursuits. The " seconding" system, if properly applied, is sound and reasonable, and advantageous to the regiment and to the public service ; but there is an uncertainty in its application. It is considered undesirable that an officer should revert to regimental duty after a continued absence therefrom for 10 years, but this ruling is again overruled by the nature of the Staff employment, in which an officer may be engaged. It may be the Brigade or Divisional Staff of the Army, or the Survey or Department Public Works, which being *quasi* Military, are considered not to be prejudicial to knowledge of Artillery matters, and therefore such Officers are not invariably seconded. To use a generally adopted phrase, it appears to be " complicated, uncertain in action, based on no clear principle, and inadequate for its purpose," and under such circumstances it would be better to have no supernumerary Officers. The Regimental List No. 189, for February 1871 shows (36) thirty-six Officers not performing regimental duty with the Royal Artillery who are not seconded, some of these are with Local Native Batteries, but others never see a gun or gunner from month to month and year to year.

3. The surplus of 225 officers includes 77 seconded officers. Whether this surplus exists tangible, or is only a peculiarity appertaining to the science of numbers I am unable to say.

The question next for consideration in Captain Oldfield's scheme is, as to its adaptability to the Artillery requirements of India. There are 50 European Batteries serving in Bengal. We should require the following, *viz.*—

6 Divisional Commanders being Colonels on the Staff attached specially to Army Divisions.
16 Divisional Staff Captains.
14 Colonels, Second in Command.
14 Adjutants.

11	Horse Battery Commanders	}	Horse Brigade.
11	ditto Second in Command		
33	ditto Subalterns		
23	Field Battery Commanders	}	Field Brigade,
23	ditto 2nd in Command		
69	ditto Subalterns		
16	Garrison Battery Commanders	}	Garrison Brigade.
32	ditto Subalterns		

This gives a total of 258 officers. It will be seen that the total now is 346 including 36 in India but absent from regimental duty, and 65 at home on leave, etc., etc. Now what are the defects of the present system of Artillery Organization, as applied to the requirements of India in the matter of Artillery, which would be removed by adopting Captain Oldfield's plan.

1. We should avoid having a surplus of Head Quarters and Staff of Brigades, that is India has 88 Batteries, being 11 Brigades, but it has actually 16 Head Quarters of Brigades.

2. It would place the Colonel Divisional Commander in a position more becoming his important command.

3. It would diminish the tendency to "rusting" to which many Field Officers, owing to the glut in the market of that commodity, are liable from want of occupation.

4. The Battery Commander would hold a rank more in keeping with his command. "A battery with its guns is equivalent to a regiment with its colours, and is to be selected accordingly." These appear to be the salient points of Captain Oldfield's scheme applied to India. Let us remark on them. The first must commend itself to all having financial proclivities. If 11 men can do the work equally as well as 16, why employ more.

The second point is one, which from the beginning has always been substantially denied to the Artillery in India:—"The Viceroy and Governor "General of India having decided that the home system of district and "station Artillery commands shall, *as far as* practicable, henceforward "obtain in India in supersession of the present system. The Head "Quarters of only one Brigade of Artillery will be located in each Division "or District, and the Artillery command of the Division or District will "be exercised by the Officer commanding the Artillery Brigade without "extra emolument."

The practical result is: a Colonel commanding a Brigade at a station with two Horse Batteries, two Field Batteries and a Garrison Battery commands these locally, besides three or four others in his Division. A Battery with its guns is equivalent to a regiment with its colours, and is to be selected accordingly. The Brigade commander in the above case would be commanding four and a fraction of a regiment, but he only draws the same pay as a Lieutenant Colonel Commanding a regiment. The growing importance of Artillery in War would seem to recommend a modification of the present system. I have never been able to understand why the Artillery and Engineer Officer is proscribed from all high military command in the British Army. Look at the working of a different practice in India. Sir G. Pollock, Sir S. Whish, Sir A. Wilson, Sir H. Tombs, Sir J. Cheape, and last but not least the present Commander-in Chief Lord Napier of Magdala, have all in their turn displayed fitness for high command.

Let us hope that with the abolition of purchase this unreasonable proscription of Officers, the most scientifically educated of all Officers in H. M.'s Army, may be withdrawn.

3. The third evil arises from the one immediately preceding. That is, if a Colonel can only draw pay by virtue of his Brigade command, he naturally retains it, and actually does all the executive work of the Local command of Artillery, and thus there is no work for Field Officers at the same station as himself. Their professional knowledge is called into activity only when some unfortunate Gunner is to be awarded a heavier punishment than three days C. B. Such a training for five or six years would, I can quite conceive, render an Artillery Officer exceedingly rusty.

The fourth point is one that deserves consideration. Two men holding equally important commands go into action, both, if they survive, are rewarded, one being a Lieutenant Colonel gets the C.B., the other being a Captain gets a brevet majority.

I have taken up Captain Oldfield's scheme, and applied it as far as my judgment can guide me to the present constitution, not of the Royal Artillery but to the Artillery Service especially. As regards the regiment to which I have the honor to belong, I have, I think, shown the necessity which exists for a modification of the present state of Artillery Organisation. Not only because the standard of physical efficiency is unequal but, because events in the campaign just closed in France would appear to recommend such modification. There appear two objections to its adoption, one that of expense, and the second that of the supersession of the Senior Officers of the Royal Artillery by the older officers of the Indian Artillery. In the Junior grades the supersession will be the other way.

Both objections, however, are trifling as compared to the urgency and requirements of an Artillery more elastic, more easily and less expensively (comparatively speaking) administered than the British Artillery Service in its present disunited state, Captain Oldfield deserves credit for having started the matter and his scheme is well deserving of consideration.

A.

Capt. Oldfield's scheme of R.A. Organisation, &c., worked out in figures, showing the result of the Amalgamation as proposed by him.

	Generals.	Colonels.	Lt.-Colonels.	Majors.	Captains.	2nd Captains.	Lieutenants.	Total.
Effective on Regimental List for February 1871, No, 189	64	62	122	...	248	282	678	...
" Seconded " do. do. do.	...	9	15	...	26	20	7	...
Total	64	71	137	...	274	302	685	1,533
Add by promotion " levelling up "	..	21	41	...	38	47	..	...
	64	92	178	...	312	349	685	
Deduct promoted as above	...	...	21	...	41	38	47	
Remaining	64	92	157	...	271	311	638	
Deduct by proposed retirement of 15 Colonels over 40 years' service on £750, and 32 Colonels on £600 per annum	...	47	...	...	...	...	...	47
	64	45	157	...	271	311	638	1,486
Deduct by promotion to complete Establishment	..	6	101	...	145	124	...	...
Remaining	64	39	56	...	126	187	638	...
Add promoted as above	6	101	78	67	124	...	...	...
Total	70	140	134	67	250	187	638	...
Captain Oldfield's proposed establishment for 226 Batteries	70	140	134	67	250	..	690	1,961
Excess over proposed Establishment	...	...	...	...	...	187	38	225

Note—£600 × 32 = 19,000£ being about $\frac{14}{31}$ of £42,000 the Annual grant made to the Royal Brigades to effect retirements in the senior grades.

IV.

On the Carriage of the Regimental Reserve of Breech-loading Ammunition in Mountain Warfare on the Punjab Frontier.

DURING the discussion which preceded the introduction of the breech loading Rifle into the British Service, among the chief considerations urged against its adoption, were the anticipated waste of ammunition, and the difficulty of keeping up the supply with sufficient promptitude on the field of battle.

To meet the latter objection, numerous suggestions were brought forward and discussed in the Military journals some years ago, but I am not aware, whether any definite plan suited to the conditions of European warfare has as yet been adopted by our Government.

In the war of 1866 against Austria, the Prussians were the first to submit the new armament to the actual test of warfare on a large scale against a first class European power, and the expediture of ammunition by their Battalions engaged upon this occasion was so unexpectedly small as to completely falsify the predictions hitherto made to the disadvantage of the new weapon in this respect.

It must, however, be remembered that the Austrians, like the Danes a few years previously, were armed with the old muzzle loader, and that the natural tendency of the crushing superiority of the Prussian Infantry fire would be to shorten the action, so that it is evident that no reliable inference as to the expenditure of ammunition in future wars can be drawn from a consideration of this campaign.

Very different conditions however existed between the belligerents in the late war between France and Germany, and, although no official history of the war has as yet appeared, yet if any dependence is to be placed upon the accounts of special correspondents, we learn that the French on more than one occasion were compelled to relinquish their hold on strong positions, owing to the exhaustion of their pouch ammunition, and the absence or want of mobility of their reserve supplies.

As this important subject will probably attract renewed attention at home, when the official accounts of the late war begin to be discussed, it may not, perhaps, be out of place to publish in the Journal of the United Service Institution of India, a few notes from a report drawn up on this subject towards the end of 1868 in reply to a letter from the Adjutant General of the Army with reference more particularly to the experience gained during the late campaign in Hazara.

The 1st Battalion 6th Regiment marched from Rawal Pindi for Hazara on the 13th August 1868 at the very hottest period of the year. The reserve ammunition accompanying the corps consisted of 392 boxes of 500 rounds each, in all 196,000 rounds of Boxer ammunition carried on 49 camels at the rate of eight boxes or 4,000 rounds per camel.

As it had been ascertained by actual experiment a few months previously that the ammunition when exposed for a few hours to the direct rays of the sun was rapidly destroyed and rendered useless by the decomposition or melting of the cement, and probably by the expansion of the metal envelope, every precaution was adopted for its preservation against the effects of the intense heat then prevailing.

With this view, the cases were stored in a large double fly tent pitched under trees whenever possible, and the "kunats" were raised all round to ensure circulation of air, non-conductors of heat such as spare tents, "gunny" bags, "suleetahs," &c., were piled over the boxes, and tarpaulins were furnished for each load for protection from rain.

These precautions were entirely successful, and the ammunition on the return of the regiment to Rawul Pindee was found quite uninjured, although it had been exposed to extremes of heat, cold, and weather for nearly four months, and for three weeks of this time without even the protection of a tent,

In considering the circumstances under which the regiment was taking the field, one of the first points that suggested itself was the evident unsuitableness of the 500 round ammunition boxes to the conditions of mountain warfare, and therefore the difficulty of bringing the reserves rapidly to the front over ground often hardly practicable even for Infantry.

On consulting with Brigadier General Vaughan, C.B., upon this very important matter, I was informed by that officer whose long experience of hill warfare entitles his opinion to great respect, that the same difficulty had been felt by the regiments of the Punjab Frontier Force, and that they had adopted the expedient of having each box fitted with leather cartouches furnished with handles, each cartouche containing as many rounds as a man could carry with ease.

This excellent plan obviously secured the greatest possible mobility over difficult ground, but it was plainly inapplicable to our case at such short notice, and as the only improvement available under present circumstances, permission was obtained to attach a second rope handle to each box. There was some difficulty in effecting even this with the means at our disposal on the march, but it was surmounted by the somewhat clumsy expedient of cutting notches in the four opposite edges of each box to hold the rope.

The wedge-shaped sliding lids of the ammunition boxes of the pattern under discussion are secured by a single screw which is liable to set fast, and indeed while on the march to Hazara, I was informed, that on one occasion during the Abyssinian campaign, much difficulty was found in getting at the contents of some of these boxes either from the above cause, or from the absence of a turnscrew at the moment.

Taking advantage therefore of this warning, orders were given for

the screw of each box to be removed, well greased and then replaced, so that the head projected slightly from the surface of the lid.

It might be a matter for consideration, whether it would not be an improvement to fasten the lid by a small brass button (fitted with stiff friction, so that it could be turned round by the finger, or by a blow from a stone, or the heel of a boot), either by itself, or in combination with the present screw, the latter being removed on service.

Upon the arrival of the regiment at Oghie, the immediate base of operations, it became necessary to substitute mules for camels to carry the ammunition into the hills, and Major General Wilde with Brigadier General Vaughan decided, as the result of their experience, that the limit of a mule load should be 1,600 rounds, in consideration of the difficult ground to be traversed.

The only means of re-arranging the ammunition in conformity with this plan was by removing 100 rounds from each box, and filling up the vacant space with the gunny envelopes removed from the boxes.

Thus each mule carried four boxes of 400 rounds each, or 1,600 rounds to a load, and though severely tried during three weeks' incessant marching over mountains without the vestige of a road, their strength and endurance were not unduly taxed with the load above mentioned.

But against this mode of packing, the following considerations present themselves. The vacant space in the boxes, if not filled with gunny would probably have to be packed with straw as the only available substitute, and both these substances would absorb moisture from the atmosphere in the event of continued wet weather to the probable injury of the cartridges.

Each mule is uselessly loaded with the weight of one box nearly, and as the four boxes have to be enveloped and roped up in the "suleetahs," the contents cannot be got at so rapidly as might be desirable.

To these objections it may be added that the opening and re-packing of each box was a long and fatiguing operation for which time might not be available on future occasions, and much difficulty was found in providing for the safe custody in camp of the 100 rounds removed from every box for which there was no proper storage.

As the result therefore of our experience on this occasion, I would beg to submit the following Memorandum:

On a force taking the field from Rawul Pindi in support of any threatened point on the Punjab Frontier, the regimental reserve ammunition owing to the scarcity and cost of mule carriage would usually be conveyed to the immediate base of operation on camels, while after entering the hills, mules are the only means of transport practicable.

The difficulty therefore has to be faced, of adapting the cases to both means of transport.

From the opinion of Generals Wilde and Vaughan, amply confirmed by the experience gained in the late Huzara campaign, it may, I think, be assumed that 1,600 rounds of Boxer ammunition should be the maximum load of a mule for operations over difficult ground.

But in order to develop to the utmost, the power of breech loading arms, it would appear that some means are urgently required especially in view of the peculiar nature of warfare on this frontier to increase the mobility of the regimental reserve ammunition.

It is evident from the above considerations that the present 500 round boxes are from their size ill adapted to Mule Transport. They are moreover too heavy to be carried up hill or over broken ground by one man, while the fact of their being furnished with only one handle makes it almost impossible for a second man to assist in handling them.

As four of these boxes must go to a mule load, it becomes necessary as above explained, to remove a portion of the contents of each box to avoid overloading the mule, and the load thus constituted requires to be enveloped and roped up in a suleetah, involving the labor of two men, at least, to say nothing of the trouble and delay before any portion of a mule's load can be got at.

I would therefore suggest that a certain number of ammunition boxes of the capacity of 800-rounds each should be made up and kept in store at Rawul Pindi and Peshawur to meet the special requirements of Frontier service.

The boxes should be fitted with four rectangular leathern cartouches, each to hold 200 rounds and to be furnished with a cover and handle at the top.

On a regiment taking the field its ammunition should be at once transferred from the 500 round boxes into these cartouches and the latter placed in the ammunition boxes.

The following advantages would appear to be secured by some such arrangement as that suggested :

1. The 800 round boxes while more especially adapted for mule transport would also be available for camels. Four thousand rounds packed in five of them would be a less load for a camel than the same number packed in eight smaller boxes, and probably no practical difficulty would be found in packing the fifth box over the saddle, as the centre of the gravity of the entire load would be sufficiently low down to ensure its stability on the march, or loads of six boxes might be allotted to the strongest and four to the weakest camels if considered a better arrangement.

2. The mule load of eight cartouches or 1,600 rounds would be readily accessible without unpacking the mule, and the whole or any

portion of it could be transported by hand with the utmost rapidity to any point where it might be required.

3. Each box being fitted with chains and hooks for the mule saddle, no suleetas or ropes would be required, and therefore a much smaller fatigue party would be sufficient for loading and unloading the animals.

4. In the event of a mule being shot or going over a precipice, its load could be at once distributed in small portions among the other animals or carried away by hand.

The foregoing suggestions for the mobilisation (if I may so term it) of the Reserve Ammunition of Regiments, are by no means offered as a final solution of this difficult question, but rather in the hope that some of the officers of the Punjab Frontier Force, or of British Regiments who have served on the Frontier may be induced to give us the result of their experience on a matter which, considered in connection with the new armament of the British Infantry, will compel serious attention the next time we are engaged in real warfare with the hill tribes over the Punjab Frontier.

C. C. OSBORNE, *Colonel,*
6th Royal Regiment.

The following letter from Quarter Master Sergeant Martin, which has kindly been placed at the disposal of the Council by Colonel Dillon, contains a suggestion on this subject and is therefore published:—

Landour, 17th March, 1871.

SIR

I have read that in many engagements important posts have been lost, and others equally important would have been gained, for the want of a few hundred rounds of ammunition (Rifle). I respectfully beg leave to offer a suggestion, which I think would obviate this, *viz.* let one man of each section of a company carry instead of his kit a great coat, blanket, and a waterproof contrivance with pockets, to be placed between the coat and blanket, to hold a number of rounds of Ammunition equal in weight to the man's kit, say 200 rounds, this would give a company 800, and a Regiment of ten Companies 8,000 rounds of Reserve Ammunition, thus each Company, Regiment, and Brigade of Infantry would carry its own Magazine on a small scale. The men's kits could be placed on the Ammunition waggon, and if they should be too late to supply their Regiments with fresh Ammunition (which has often been the case), they ought not to be too late with the kits for the use of the men after perhaps a hard day's fighting.

The men told off for this duty should always be in the rear rank, and in case they should be killed or wounded, their right and left hand men should be ordered to secure the Ammunition, also the Non-Commissioned Officers in the Supernumerary ranks should be warned to see these orders carried out even to the extent of carrying the Ammunition themselves, thus securing an additional supply ready at hand which the rapid firing of the Breech loading Rifles of the present day seem to necessitate.

I am, Sir,
Your obedient Servant,
GEO. MARTIN, *Qr. Mr. Sergeant,*
Convalescent Depôt, Landour.

V.

On the Defence of the North Eastern Frontier.

You ask my views on the defence of the N. E. Frontier; by the N. E. Frontier I understand the tracts of country lying between Darjeeling on the N. W., Suddya N. E., Dacca S. W., and Munipore S. E.

The first mentioned station is not contained within the E. F. command as at present constituted, but belongs naturally and strategically to it. The latter place is beyond the limits of the empire, but having imposed upon the country a ruler obnoxious to the people, and having accorded our protection to the usurper, we find ourselves almost annually compelled to support our election by force of arms.

I believe a more difficult question could scarcely be propounded than how to defend this vast tract of impenetrable mountains and pestiferous jungle from the incursions of the hardy highlanders who inhabit and surround it.

That our efforts to do so have hitherto failed, the whole history of the country since the conquest of Assam in 1824, until the present moment testifies; the history of our wars is a list of defeats and failures, until the tribes have learnt to despise our blundering efforts to chastise them, and eagerly to appreciate the black mail which in the end the Government pays to secure their forbearance.

Politically the first step in the regeneration of this province seems to me its severance from the control of the Bengal Government, and its constitution as a Chief Commissionership under the most able and energetic administrator available.

It would be useless to attempt even the wisest or best considered military operations on this Frontier, unless the commander had the hearty support of all the Civil officials, without it no General who valued his reputation would willingly undertake the conduct of any Military operations.

The magnitude of the problem proposed must not be lost sight of; we are required to hold and defend a country larger in its actual extent than England and Wales, larger in proportion to its means of communication than the whole of Europe, with five Regiments of Native Infantry. A country moreover for the most part of pestilential swamp, intersected by mighty streams, and centered and surrounded by rugged and impenetrable mountains, inhabited by hardy and warlike clans. Success under such circumstances can at best only be partial, and will probably be due as much to the ignorance or forbearance of our enemies as to the force of our arms.

However, in the present financial condition of the Empire, it is hardly likely that the Government will be inclined to sanction any increase of the military expenditure, we are, therefore, led to consider whether with the means already at our disposal, we can honestly fulfil the

obligations of the sovereignty we claim, by insuring our subjects from attack, and assuring them a peaceable possession of their lands and property; and here it may fitly be remarked that our authority over a great extent of this frontier, especially the most turbulent portion of it, is rather fictitious than real, we have painted the maps red, but savages have not got atlases, in truth we have rested content as the Burmese did before us in claiming the subjection of these territories, but neither they nor we have succeeded in supporting our pretensions when it has suited the convenience of our so-called subjects to ignore them.

War being an exact science, certain causes produce certain effects, with limited means therefore we must be contented with partial success.

The extent of the frontier is too large, the force at our disposal too small to admit of a defensive policy, such a policy, at least as is now so popular in Europe as the non-intervention policy, a trader's incarnation of political selfishness. A policy of rigid repression is alone feasible. The British Government must make its power felt and feared. To do this we must greatly increase the efficiency and mobility of the dimunitive force at our disposal.

Though experience shows that Providence fights on the side of the heaviest battalions, it is no novelty to train and equip a small force to be in all respects as efficient as a much larger one, and the efficiency of a force may be considered to be relative to the foe it is required to contend against.

The necessity which exists for counterbalancing deficiency in numbers by increased efficiency would appear to have been lost sight of on this unhappy frontier, where for years the local regiments were the worst in the whole army, and where allowing for the revolution and partial reorganisation which the collapse of the system during the late campaign in Bhootan rendered imperative, things are but partially changed for the better. If, as is natural, we turn to the Punjab Frontier Force for guidance, we find that the protection of those regions is confided to a force the flower of the whole Native Army, officered entirely by selected men, and commanded by a General, whose peculiar ability in his profession has pointed him out for the position, but all this is changed at the other extremity of the empire, with a greater extent of frontier to guard, and a far smaller force to accomplish the task, a minimum amount of efficiency has been attained. Appointments to the local regiment being popularly, and apparently not without reason, esteemed as professional death.

This should be all changed in the first place by appointing young and active officers of promise to the local regiments, and by insuring them in return for superior qualifications and greater risks, quicker Regimental advancements than in the rest of the Native Army. there need not be any difficulty in this, the effects of the climate permitting of exceptionably rapid advancement to the survivors.

To a certain extent officers in these regiments should be secure from supersession from outsiders. I say only to a certain extent, as the infusion of new blood is always a healthy process, and nowhere it is more necessary than in Assam ; but when the opportunity occurs which permits of an outsider being brought in without prejudice to the claims for rapid advancement, which we will suppose conceded to the officers of the local regiments, the officers so brought in should have more solid claims for promotion than that of having for some years held a lucrative appointment in one of the civil branches of the service, an appointment such as this appears to be an injustice to all those who have accepted frontier service with its disagreements in the hope of thereby earning some recognition of their services.

To turn to the men of which the three frontier Regiments were composed. Unfortunately the inhabitants of the plains of Assam are a weakly and debauched race, and it has been decided not to enlist them as soldiers. The same objection does not extend to the Hill Tribes, many of whom are of fine physique, and from their knowledge of the country and the manners of its inhabitants would, if enrolled in our ranks, be invaluable as soldiers, it is I am aware the fashion to say, that these tribes will not take service, but I doubt if the experiment has ever fairly been tried, if not, the most favorable opportunity now presents itself for attempting it through the influence of Captains Gregory and Williamson, the lately appointed Deputy Commissioners with the Naga and Garrow Tribes. Were hill men obtainable, I would propose their enlistment into the 44th Native Infantry, which is located at Shillong in the Kassia Hills, the climate of that place being suitable for them. The 44th Native Infantry consists at present of Hindustanis, and an inferior class of Goorkha or rather Nepaulee, the Hindustanis would be well replaced by the indigenous hill Tribes, the Regiment would then under the advantages we have supposed of selected officers take its place as the Guide Corps of the N.E. Frontier, making the corps of Guides of the Punjab Frontier Force its model.

The 42nd and 43rd Native Infantries are composed mainly of Hindustanis, and must I suppose continue to look to this class for recruits. Service in Assam involving expatriation and a complete change in climate and diet, is very unpopular with the inhabitants of the Punjab; I fear, therefore, that it will be found very difficult to keep up any large number of this most soldier-like race in these local Regiments, moreover the Punjabee loses much of his vigor when reduced to a rice diet. The Oude man, on the contrary, thrives fairly upon it and though now fallen very low in popular estimation, has when well-drilled and commanded, proved his capacity as a soldier in all our campaigns on this continent; I think, therefore that if in the first instance recruits are well chosen, and then carefully trained by selected Officers, good and reliable regiments might be expected.

The Sepoy in Assam receives a very considerable addition to his pay under the regulation for compensation for dearness of provisions, it ought

not therefore to be impossible to select men for enlistment, while on the subject of this compensation for dearness of provisions, the sepoy's avarice very frequently leads him to fill his purse at the expense of his stomach, reducing his strength and filling the hospitals. Commanding Officers, should adopt strenuous measures to check the abuse of this allowance whether or not it might not be advantageous to abolish this grant of compensation, and proportionally increase the pay of these Local regiments,is a question worthy of consideration. The three Native Infantry Regiments in Assam are now localized to their respective stations, the Head Quarters of the 42nd being at Debrogurh, the 43rd at Gowhatty, and the 44th at Shillong in the Kassia Hills, an arrangement which is unfair, and works very injuriously to the well being of the Force, and which the pseudo Goorkha element of the 44th Native Infantry gives it no sufficient right to claim. Were the 44th reconstituted as a Guide Corps as above recommended, it would then be proper to retain it ordinarily in the hills, but in this case, the 42nd and 43rd Native Infantries should periodically exchange stations, a measure conducing most materially to the efficiency of either regiment, and being likely to demonstrate more readily to the inhabitants that it is at all times possible for us to move up troops to their neighbourhoods.

Whatever weight we may attach to the arguments of those who insist that our Native Troops should be armed with a weapon, which will soon with the bow and arrow possess only interest for the antiquary, the exigencies of our position on the Eastern Frontier, and the absolute necessity which exists for counterbalancing our want of numbers by offensive power, should here be permitted to decide the question, and no time should be lost in arming these frontier regiments with breech loaders; even if for the sake of arugment it be admitted that the experiment would elsewhere be dangerous, the geographical position of these regiments is ample guarantee for their fidelity.

On the subject of Artillery, experience, I think, shows that in Mountain Warfare the effects obtained are in no way commensurate with the difficulties of its transport; mountains. especially when as on the Eastern Frontier covered by dense jungle, not permitting the developmeut of the offensive qualities of this arm. Mortars are very useful for the reduction of stockades, and have the advantage of being more portable than guns, the 5½ inch is the smallest that can be depended upon for having any effect on the heavy shingles of which these stockades are frequently constructed; at any rate two of these Mortars with the necessary equipment and ammunition should be maintained at Shillong, a detail of the 44th Native Infantry being in the absence of professional gunners instructed in their use.

It has been claimed by the advocates of rockets that they are "the soul of Artillery without the body," owing to their extreme portability they have always possessed the most apparent advantages for mountain warfare, and recent improvements have made them reliable, I think that a battery of Hale's 6-pr. Rockets, such as we had with the Naval

Brigade in Abyssinia would be of the greatest advantages on the Eastern Frontier, and this equipment I would recommend to be attached to the Infantry Regiments at Shillong and Debroogurh. Details of these Regiments being instructed in their use.

Though the Elephant is par excellence the beast of burden in Assam, a proportion at least of mule carriage should be maintained for the transport of the mortars and rockets. Small as the Force at our disposal in these regions is, it has been unnecessarily frittered away in small detachments, many of which might advantageously be withdrawn, their places being supplied if necessary by Police. I would instance Golaghat, a small civil station in the Seebsaugor district, occupied by a detachment of 50 men of the 42nd Regiment Native Infantry, a detachmeut of this strength is useless if intended as a support to Captain Gregory's (Deputy Commissioner's) advanced post at Samogooting in the Naga Hills, while it is unnecessary for the defence of the few residents of the station, who are not exposed to any sudden attack. It is proverbial that weak detachments invite attack, and the experience of the Eastern Frontier has proved the truth of the assertion. It would I think be strategically prudent to concentrate our forces in Assam at Shillong, Gowhatty and Debrooghur, maintaining only Cachar and Suddya as Military Outposts. Cachar looking to Shillong for support, Dacca being the reserve of Shillong and Suddya being supported from Debrooghur. Were the Lallee Chaprie, (between the Lallee and Dihong rivers at their confluence with the Brahmapootra) selected, as has been suggested, for our Military Station in Upper Assam, a still further concentration would be possible as then it would be unnecessary to maintain a garrison at Suddya. Buxa in the Bhootan Dooars is supported by Julpigori, and has a reserve in Darjeeling.

The small Station which it is here proposed should be confined to the protection of the civil power might be supplied with masonry towers, similar to the one at Dikrang and those along the Singphoo Frontier between Suddya and Jeypore ; these towers while capable of affording protection to a number of persons could easily be defended by half a dozen men against the attacks of any savages.

What an important effect such a concentration might be expected to have on the efficiency of the force, may be inferred from the fact that Colonel Rattray, Commanding 42nd Native Infantry, informed the writer that when he assumed the command, there were men who had been 14 years on detached duty, that is removed from all supervision and probably under the command of a native officer who in his generation had learnt his profession under similar disadvantages. Moreover, such a concentration as is here suggested would admit of a blow being struck with effect in any direction in which we might find ourselves menaced.

To strike effectually, we must strike quickly; having secured a reliable and formidable force we must be able to transport it to any given point with certainty and rapidity. Communication in Assam is almost entirely by water.

Two steamers should at all times be at the absolute disposal of th Chief Military Authority, such steamers being alogether separate from, an independent of, civil control. The usual position of one of these steamer would be at Chattuk on the Surma to the south of Shillong, the secon at either Gowhatty or Debroogurh on the Brahmaputra, as circumstance might seem to require.

These steamers with their flats would be capable of transporting a a moment's notice a force of about 500 men fully equipped for service with say two mortars and rocket cradles and their mule transport Moveable columns should at all times be in a state of preparation a Buxa, Shillong, and Debroogurh.

The personal equipment of the troops should be especially and stringently regulated on this frontier, Officers and men being accustomed to look upon tents as superfluous encumbrances, a kookerie or its Assam equivalent, a dhow, being supplied to the troops and attached to the waist belt, the bivouac being naturally adopted to the country. From Shillong the Head Quarters of the Force, the General would at all times be able by proper transport arrangements to have the force above indicated on board at Chattuk and under weigh in 48 hours from leaving quarters heretofore the opportunity for striking has always been lost owing to the time required to obtain transport and equip the force. These steamers could be utilized for the service of Government, whenever the General considered that their services could be temporarily dispensed with.

It is of vital importance that the most cordial relations should exist between the Chief Civil and Military authorities. The Military Force in Assam has always been supplemented by a civil Contingent of Police, but possessing a *quasi* military organization, and performing duties of a military rather than civil nature. To such an extent has this been the case, that it has happened that the Civil forces have been engaged on Military expeditions against the neighbouring tribes without the privity of the Military authorities; a more pernicious system could not be imagined than to permit a partially drilled semi-military body, under unprofessional guidance to involve itself and the Government in military operations. If, as is here proposed, the military force on the frontier is concentrated, the posts vacated being occupied by Police, no reduction in this force will be possible, but as long as it retains its Military organization and is employed on military duties it should in these matters be directly subordinated to the Chief Military authority.

Divided counsels are at all times bad but in Military operations a system of divided responsibility and command inevitably leads to disaster.

These are some of the ideas I formed during two and a half years service on the Eastern Frontier and in Bhootan. I do not claim for them originality, or that they offer any panacea for our troubles, but I think they point out the way to render our position there secure and on of right, rather than of sufferance.

P. S.—I take it for granted that the Eastern Frontier now possesses uninterrupted telegraphic communication between at least all the principal stations, if not, no further delay should be permitted in completing the lines without any regard as to whether they are likely to pay commercially.

S. N. S.

VI.

Pioneers.

FROM the days of the re-building of Jerusalem under Nehemiah, by whose direction "they which builded on the wall, and they that bare bur-"dens, with those that laded every one, with one of his hands wrought in "the work, and with the other held a weapon," down to the present day in this country, when the villagers on the North-Western Frontier may be seen ploughing their fields, with matchlocks slung over their shoulders, or lying near them, handy in case of a sudden attack, men have often been compelled by circumstances to combine the duties of laboring and fighting. In many a campaign the work required of soldiers is as much that of laborers as that of fighters, and men trained to the use of pick-axe and shovel as well as of sword and rifle are then invaluable. But, though the training of soldiers to the use of arms is always carried on in time of peace, training them to the use of working tools has too frequently been left till the necessity arose for their use in time of war. This is a point which appears lately to have been occupying a good deal of attention among military authorities in different parts of the world, and Pioneers are springing up in the armies of many nations. Various systems are being tried, some of them being as yet only experiments. At the very outset the questions arise, how many tools are there to be? and who is to carry them? Russia sticking to her old system of uniformity gives every man a tool to carry. Denmark gives one to each file. Prussia has her special battalions equipped for the purpose. America has two companies told off by roster to carry the tools of each battalion, a sort of republican effort at equality, which is probably the worst plan of all. In the British Army there is as yet no arrangement of this kind, but that things are tending that way may be inferred from the introduction lately of the "Shelter Trench Exercise," which is a step in the same direction. England certainly has her Corps of Royal Engineers, but there appears to be this distinction between the men of that Corps and Pioneers proper, that the Royal Engineers are skilled artisans and laborers, who are armed that they may defend themselves if attacked; while Pioneers proper are soldiers who carry and are trained to the use of working tools, in order that they may thereby render themselves more efficient as fighting soldiers. The same difference exists in an even greater degree between the handful of men called Pioneers, who are attached to each battalion of British Infantry, and the Pioneers now spoken of.

Though England has no British battalions of Pioneers, yet she has, and has for some years had in the Indian Army, two regiments of them, and it is possible that a few notes on their origin, the class of men of which they are composed, their equipment, pay, and services may not be uninteresting.

The two regiments are the 23rd and 32nd Regiments of Punjab Pioneers.

Both these regiments are composed chiefly of Muzbee Sikhs. The true Muzbees are a race of men descended from a low caste Hindoo, who for services rendered was admitted to the Sikh religion by Gooroo Govind, the chief of that faith; but there are many Muzbees, converts of the present day, who cannot claim descent from Jewun Singh, the progenitor of the genuine Muzbees. Though nominally admitted to the brotherhood the Muzbees are still looked down upon by the pure Sikhs, and indeed, setting aside their low origin, their character is seldom such as to command respect, but they make good soldiers and take kindly to hard work or hard fighting. When not on active service in the field, or kept steadily at work, they require to be held in with a tight hand, for they are otherwise apt to fall back into the vicious and criminal ways that appear to be natural to them. It was a Muzbee who first introduced "*Thuggee*" into the Punjab, and Muzbees always formed the majority of those who indulged in the crime in that province. This fact led Mr. Brereton of the Thuggee Department, with a view to keeping as many of the class at legitimate work as possible, to propose in 1852 that a Civil Corps of Muzbee Pioneers should be raised for employment under the Engineer Department, Nothing seems to have come of the proposal till the mutiny of the Bengal Army in 1857, when such a corps was actually raised for service at the Siege of Delhi. This corps was afterwards embodied as a regiment and is now the 32nd Punjab Pioneers.

About the same time too the 15th, now the 23rd Regiment of Punjab Pioneers, was raised at Lahore from the same race.

The only other class, which enters to any extent worth mentioning into the constitution of these regiments is the Ramdassee. The Ramdassees are weavers by trade and in manners, appearance, and physique are very similar to theMuzbees.

Although frequently employed on Pioneer work it was not till 1864 that a regular Pioneer equipment was sanctioned for these regiments, and they were not fully supplied, the 23rd at any rate, with the equipment sanctioned till 1866. The 32nd, being then stationed at Ferozepore close to the Arsenal from which it was obtained, and being under orders for active service in Bhootan, received their equipment in 1865.

The following is what was allowed—

Arms—Smooth-bore fuzils.

Accoutrements—Brown leather.

Working Tools—

10 Hatchets 30 Pickaxes 35 Shovels 6 Felling axes 6 Saws 9 Bill hooks	For each company, to be carried by the Non-Commissioned Officers and men.

20 Shovels 20 Pickaxes 3 Felling axes 5 Hatchets 3 Saws 5 Bill hooks 1 Set of blasting tools with proportion of gunpowder	} In reserve for each company.

Also files, rasps, vices and planes, etc. for the establishment of a blacksmith's and carpenter's shop in each company.

With a few alterations the above is the equipment now in use with the Pioneer regiments. The 23rd have since been armed with short Enfield rifles with sword bayonets, and *every* man is to carry a hatchet. Instead of the English spade the men carry the native "*phowrah.*" All the working tools are carried in leather cases, the picks, axes, saws, and *phowrahs* being strapped on the back, (the helves of the latter detached from the blades and slung in loops outside the cases) while the hatchets and bill-hooks are hung on the waist-belt, and the dark lanterns are carried by the buglers, strapped to their backs.

Much time and care was given by various officers to devising an arrangement of straps for the tools, which should not cramp the movements of the men carrying them, and in reducing the weight of the arms, accoutrements, and ammunition, to make up for the additional weight of Pioneer tools imposed. Subsequent experience shows some slight alterations may still be made with advantage.

The average weight of Pioneer tools and equipment, which each man has to carry, is about 9lbs. To compensate for this, in some measure, the men are armed with short rifles instead of long, and the 40 round ammunition pouch with its shoulder-belt is done away with altogether,—thus cutting off about 5lbs. and leaving an unavoidable addition of about 4lbs. to the weight to be carried by each man.

The arrangement for the carriage of the pick-axes and *phowrahs* (*i.e.* of the majority of the tools) involves a small strap across the chest, which though it presses lightly is apt to interfere with free respiration. The straps for the felling axes and saws cross one another on the chest, and are therefore open to the same objection, in addition to which they are apt to cut into, or at least to rub, the neck of the wearer. To obviate these disadvantages, a set of straps might be used fastening by loops at one end to the tool at the back, coming over the shoulders like braces, and attached to the waist-belt at either side. These straps might be made so as to be lengthened or shortened, according to the size of the wearer, and according to the thickness of the great coat, or other articles folded on his back under the Pioneer tool. To prevent their dragging up the waist-belt in front, an ammunition bag, not a stiff clumsy pouch as at present, but a bag, might be attached on each side, just where the Pioneer straps would come, each bag to contain 20 rounds. This would

prevent the waist-belt from being displaced, and would give a much wanted increase to the ammunition carried. There is no doubt that 20 rounds is too little, and it has always been found necessary to issue an extra quantity, to be carried in the havresack, whenever there has been a chance of a fight. Even 40 rounds may seem too little, but, so long as 60 is considered a sufficient quantity for breech-loaders, 40 must be considered ample for muzzle-loaders. Of course, the weight to be carried would be slightly increased by this, but it might be again reduced by substituting the ordinary bayonet for the sword bayonet. The latter weapon is clumsy and inconvenient when in its scabbard; can have little, if any, superiority to the ordinary bayonet when fixed, and can scarcely be used as a hand-sword without throwing away the rifle. This last mode of using the sword has been adopted before now by certain native soldiers who are more accustomed to the sword than the rifle, but it is not quite a thing to encourage.

As regards pay, Pioneer corps are on the same footing as the other regiments of the Native Army. In the matter of working pay, when employed on Public Works, other than those purely military works, for which no special pay is given, they are also under the same rules as all other regiments.

The following are the rates of working pay allowed by present regulations for a day's work of from six to eight hours:—

Field Officers	Nothing.	
Captains	3	Rupees.
Subalterns	2	„
Subadars	8	Annas.
Jemadars	6	„
Non-Commissioned Officers and Sepoys	2	„

There seems to be no particular reason for Field Officers getting nothing, or for Captains getting more than Subalterns; the work is in each case much the same, that of supervision. A uniform rate of 2½ rupees *per diem* for British Officers of all ranks would appear fairer.

For Native Officers a uniform rate of 8 annas a day seems advisable. They are frequently put to considerable expense for camp equipage, and in other ways when in camp at work, and there is already a great difference between the ordinary pay of the higher and lower ranks of Native Officers, which it appears unnecessary to increase.

But the most important change required is in the working pay of the Non-Commissioned Officers and men. Were two separate classes established, the second class receiving the present rate of working pay, and the first class something higher, it would be a great encouragement to the men to work their best, and it would afford their Commanding Officers the means of rewarding good workmen, which they have seldom an opportunity of doing now. About the only available reward for such men

under the existing system is promotion, and to promote a good workman is to take him from duties in which he is known to excel, and give him others in which it is highly probable that he will fail. Besides, there are so many other points to be taken into consideration in making a promotion—field service, good conduct, education, capacity for command, knowledge of drill, smartness, &c., &c.—that only an inappreciable percentage of good workmen could ever be rewarded in this way. To make a first class with superior pay need not cause any great expense. If half the Non-Commissioned Officers and men were admitted to a first class working pay of half as much again as the present rate, they would still be cheaper than ordinary laborers. But it is not necessary to go even so far as that. If Commanding Officers of the Pioneer corps were permitted to advance one-fourth of the men under their command to a first class working pay of even one-fourth as much again as at present, the object would in a great measure be gained-men would have an incentive to work hard.

The two Pioneer corps have done good service to the State in times both of war and peace. The 23rd served throughout the China campaign of 1860, including the capture of the Taku Forts and of Pekin. In 1862, it was employed for about five months at work on the Hindustan and Thibet road in the hills north of Simla. This was the first regular Pioneer work on which the regiment was employed ; but, though the men had not then the experience they have since acquired, their work was pronounced very satisfactory by the Engineer in charge of the road, by the Lieutenant-Governor of the Punjab, and by the Commander-in-Chief, Sir High Rose. In a pecuniary point of view also, it was satisfactory, the cost being calculated to be about two-thirds of what it would have been had ordinary laborers been employed, not to speak of the difficulty of obtaining laborers at all in any numbers in that part of the country. In 1863, the regiment was again employed for about six months in extending the same road ; and in the autumn of that year it was marched straight from road making to campaigning on the North-Western Frontier, and did good service at Umbeyla. In 1867, during a cholera season at Peshawur, the regiment was employed in making and improving the roads to and about Cherat, and in developing the water supply for that station. A few months afterwards it proceeded to Abyssinia, and served throughout the campaign of 1868 in that country, a campaign which was essentially one for Pioneers, and on which the corps was of the greatest use in constructing the roads and the railroad, in putting up the telegraph, and in sinking wells. In the latter part of 1869, it was employed, first, for about six weeks, in improving and widening the Murree and Abbottabad road, and, afterwards, in opening out roads in the Agrore Valley in Huzara. In 1870, it again worked for between three and four months on the Murree and Abbottabad road. The saving effected in favour of the State by employing the Pioneers in place of ordinary laborers in the work on which they were engaged in 1869-70, was calculated by the Executive Engineer of Huzara to amount to close on 2,300 rupees. The regiment

is again at work this summer (1871) on the Murree and Abbottabad road, but, instead of getting fixed rates of daily pay, a special contract arrangement has been entered into, which gives about two-thirds of what is paid to ordinary laborers.

The 32nd Regiment has also done valuable service both in the field and on Public Works. It served with distinction in the mutiny, at the Siege of Delhi and at the Relief and Capture of Lucknow, on the North-Western Frontier at Umbeyla, and in Bhootan; and it has been employed in road making near Murree, and at Cherat, in mining for the tunnel under the Indus at Attock, and latterly in constructing the roads about Raneekhet.

It must not be supposed that work has to be made for the Pioneer Regiments. All works on which they have been employed have been such, that had the Pioneers not been employed on them, they would have had to be executed by others at a greater expense to the State. The State also gains in another way, by having a training given to its soldiers in time of peace which is sure to be of use in time of war.

In conclusion, it may be remarked, that the idea, which many military men now hold, that every soldier should carry a working tool as part of his equipment, appears to be a mistaken one. Give every man a working tool, and every man will consider it a nuisance. But equip certain regiments specially as Pioneers, and those regiments will take a pride in their speciality, and will do all in their power to bring pioneering to perfection. Make more Pioneer regiments if you will. But stop somewhere.

Let there be some individuality, and individuality will beget *esprit de corps*, and with *esprit de corps* a regiment will " go anywhere and do anything ! "

A. DUNLOP ANDERSON, *Captain,*

23rd Punjab Pioneers.

Camp Gah, 13th June, 1871.

LECTURE.

Simla, Friday, the 14th July 1871.

HIS HONOR THE LIEUT.-GOVERNOR OF THE PUNJAB IN THE CHAIR.

On the state and prospects of the Indian Army.

BY MAJOR ARTHUR CORY, BENGAL STAFF CORPS.

WHEN a nation extends its sway by permanent conquest over foreign countries, politically weaker or inferior in military skill to itself, one of the chief means of spreading its power and consolidating its empire is the employment of the conquered people, the direct appliance of their warlike material, their soldiery, to the purposes of the conquerors, the enrolment of the vanquished under the standards and the leadership of the victors.

This would appear to be a theoretical anomaly, but that all history proves it to be a general law, true of Rome and her legions, true of Russia, true of France in Algeria, and especially true of the conquest of India by the British.

There is no gradual intermixture and alliance of the superior with the inferior nation, no blending of common interests, no fusion of the different classes into a homogeneous body; the races thus bound together by a paramount power for military purposes in the cause of their own subjugation, are, and remain, radically opposed both to one another and to their rulers in all those conditions that draw men into the aggregates we call States.

Thus in character as in habits, in social observances as in tone so thought, in ethics as in the formulæ of creeds, the numerous Asiatic nations which have fought in our ranks with the one common object of our aggrandisement, are in antagonism each to each with a bitterness which can only be rivalled by that which they bear to ourselves.

What is the tie then? What are the forces which bind these heterogeneous, these hostile elements into a corporate power? resembling nothing so much as those marvellous compounds chemistry creates, which in the guise of bland oily fluid, or soft powder, await but the signal of release from the spell constraining them to resume their elementary shapes with the most fatal vehemence, and the most destructive violence of explosion.

The answer is simple. The tie is one of self-interest, the forces those that underlie the motives of all human masses, cupidity and fear.

In all States and communities a military element exists, varying however greatly both in quality and proportion to the population generally, from the maximum seen in nations which are, or have been almost exclusively armies, like the Greeks, Romans and Jews of the ancient

world, to the minimum as in those where it only appears in the guise of scattered bands of robbers, such as infest Greece of modern days, and not long since were common in Bengal proper.

The profession of arms in State military employ is an institution which has in all ages universally attracted the younger and bolder classes of all countries that have reached the stage of civilization, in which each individual is not forced to eat his bread by the sweat of his brow.

But when any such State is invaded and conquered by one greater and stronger than itself, this class, the soldiery, it is which most directly suffers; for the government which supported it has perished, and the revenues that supplied it have been diverted.

The husbandman may still labor with his plough unmolested, the artisan may still work at his wonted handicraft, for no wise invader will destroy sources of wealth that shall serve to enrich himself. But the soldier, knowing nothing but his trade of arms, can find no other means of subsistence, and therefore after a period of disbandment following the collapse of the power which maintained him, sheer necessity drives him to seek refuge from want in the only direction open to him, the transfer of his services to those who can alone afford to pay for them

Besides this paramount motive there are other considerations, which soften the blow to his pride, patriotism or other susceptibilities he may have.

The love of getting the good things of life with comparative ease and indolence, and the love of successful fighting, are desires most common to human nature, and the man who has been accustomed to enjoy them will find many good reasons for seeking their continuance. Therefore if his late foe only can provide them, he will accept his services with very little demur. The conquerors, on the other hand, are glad to thus utilize the weapon to their hand.

Too few, or unsuited by climatic reasons for colonization, or to carry on by themselves the whole of the arduous duties which follow on the armed occupation of a country, they are willing enough to make their service attractive to the class whose numbers supplement their own advantageously either to keep order within their new territory, or to repress hostilities beyond it.

Thus the contract is made. But manifestly like all such contracts it will last only so long as the conditions which made it acceptable to both parties to it remain unaltered, and its terms are fulfilled by both. The relations are as between master and servant, and these would be speedily broken if we suppose the first, for instance, to be unable to pay the stipulated wages, or the latter to obtain obviously more favorable terms elsewhere. Especially would they be quickly broken if the servant had good cause to imagine that he could reverse the position and sit easily in his master's place. The tie of self-interest above alluded to

would be ruptured, the forces diverted, and the explosion would ensue. Therefore to use the word loyalty to express the obligation of the servant in this instance, attaching to it the meaning we ordinarily imply in speaking of the duty and affection we bear to our own country and sovereign, is to misapprehend the position completely.

These arguments may appear too trite to be insisted on, but as it is on the simplest elements that the foundation of all matter rests, so on these truisms depends the accurate comprehension of our real status and true policy in India, and a contemplation of these brings us face to face with the circumstances attending the Mutiny of 1857.

These are of the most vital importance to the subject we now pursue; from that event we date the birth of a new Native Army differing in many essential respects from the old one.

Between the old and the new a comparison should be fairly drawn Whatever the faults and shortcomings of the former may have been, this should be remembered of it, that it flourished for a hundred years, and that during the whole of that period it fulfilled the terms of its contract well; its career was one of almost uninterrupted conquest. Fostered by conflict and inured to war, it grew from being a band of retainers in the service of a trading company, to be one of the finest and best appointed armies of its age. It fell by its very magnitude and its very excellence.

In its first rudimentary stage, the mercenary contingent which followed admiringly the path of conquest cut out by the extraordinary daring and enterprize of the Englishmen whose aggressive and acquisitive spirit founded an Empire when they sought only for wealth, was led and commanded by officers from their own ranks and clothed and armed after their own fashion.

It is curious that the first example of training native soldiers in the European discipline was set by the French, in raising and equipping five companies of sepoys at Pondicherry in the year 1746.

But it was not long before the hint was taken and the example followed; for in 1753 we find a force of 200 English sepoys under command of Ensign Smith, with forty Europeans and two guns supplementing a large Native Army from Arcot, allied to us, and opposed to the French, bearing the brunt of the action in the field.

The change in the system, thus placing the native contingent under European in lieu of native leadership, was one of most marked significance. It was that change which gave the best material of stability to our dominions, and which proved in the time of our trial our surest stay. For the European officers of the Native Army were as mortar to the edifice, and as nerves to the vital frame. With them were cohesion and strength, without them came disintegration and paralysis.

When this truth became established by experience and its importance gradually understood, so by degrees the number of European Offi-

cers to serve with the Native Army was augmented to keep pace with public opinion and the necessities of the day.

So efficient did the Army become by this means, and by the unremitting labor and attention bestowed upon it, that at length both in drill and discipline it became second only to the British Army itself, far superior to the troops of any native power beyond our frontier, and equal to the meeting in line at the point of the bayonet the troops of the only European power, France, we have ever confronted as foes in this country. Its value thus ascertained, it was made available to the utmost. No longer confined to the limits of India, it bore arms to distant countries in the name and in the cause of England, of whose military resources it thus became an integral and acknowledged portion.

Java and Egypt, Afghanistan and Burmah, attest the share the Native Army took in spreading the British power and prestige abroad.

Its small proportional cost, compared with that of British troops, was a great recommendation to its extended employment, and it is to this one of its merits, that may be traced the commencement of the political blundering which led to its ultimate ruin.

For to this principally, aided perhaps by some unworthy jealousy on the part of the Imperial Government in England of the growth and increasing power of the Company, it was due, that from a subordinate position *(its proper position,)* from being merely a useful accessory, an adjunct to the main support of our dominion in the East, the Native Army swelled to a magnitude and was invested with an importance, out of all proportion to its original design.

In truth it dwarfed and overshadowed that which it was intended only to supplement and assist.

As province after province was gradually absorbed into our territory, so the Native Army was augmented by regiments and tens of regiments, while the English Army remained at best stationary, or was diminished to defray the expense of its rival's increase.

This did not take place without remark and remonstrance from many statesmen. Malcolm, Henry Lawrence, Sleeman, and others, pointed out the mischief which was surely growing, Ten years before the crash came, a far-seeing Governor-General was heard to mutter at a review, " I should like to see some more white faces behind those guns." But by most the danger was ignored, or selfishly considered to be too remote to require to be guarded against. It does not follow unfortunately, that because a fallacy is popular or even universal that it ceases to be a fallacy. But it is often irresistible, and the mistakes of nations are as common as the blunders of individuals, only more extensively mischievous.

And thus, in course of time, it came about that the Native Army grew, until to its sole charge was committed nearly all the Forts, the

Treasuries, the Arsenals, the Guns, the Cities, and the points of strategical value throughout the Empire, save in one, its remotest province.

Now this was distinctly a reversal of the conditions as between master and servant alluded to.

The following is a brief statement of the number and distribution of the British and Native Troops in the Bengal Presidency in the beginning of May 1857:—

DISPOSITION OF BENGAL ARMY—1857.

European			*Native*		
INFANTRY.	ARTILLERY.	CAVALRY.	INFANTRY.	ARTILLERY.	CAVALRY.
FORT WILLIAM AND PRESIDENCY DIVISION.					
		INCLUDING 43 STATIONS.			
1 Regiment 53rd Foot	1 Company and 1 Horse Field Battery	None	14 Regts.	7 Companies and 1 Horse Field Battery.	2 Regiments.
DINAPORE DIVISION.					
		28 STATIONS.			
1 Regt. 10th Foot 4 Companies of Invalids.	2 Companies, 1 Horse Lt. Fd. Bty. 1 Bullock Battery.	None	11 Regts.	2 Companiee, 1 Bullock Fleld Batty.	3 Regts. and 4 Troops.
CAWNPORE DIVISION.					
		17 STATIONS, INCLUDING OUDE.			
1 Regiment 32nd Foot.	2 Companies, with Horse Field Battery.	None	13 Regts.	6 Companies 3 Field Batts.	4 Regts.
OUDH IRREGULAR FORCE.					
		10 STATIONS.			
None	None	None	10 Regts.	None	3 Regts.
SAUGOR DISTRICT.					
		4 STATIONS.			
None	2 Companies, 2 Light Field Batteries.	None	5 Regts.	None	6 Regts.
TOTAL SOUTH OF MEERUT.					
3 Regiments.	7 Companies.	None	53 Regts.	18 Companies and Batteries.	14 Regts.

MEERUT DIVISION.

Infantry.	Artillery.	Cavalry.	Infantry.	Artillery.	Cavalry.
2 Regts.	2 Troops H.A. 3 Cos. with Lt. Fd. Bats.	1 Regt.	16 Regts.	2 Light Field Batteries.	2 Regiments.

GWALIOR AND CENTRAL INDIA CONTINGENTS.

16 Stations

None	None	None	15 Regts.	5 Companies	5 Regts.

SIRHIND DIVISION.

12 Stations.

4 Regts.	2 Troops H.A. and Head Qrs. & 1 Baty. F.A.	1 Regiment.	8 Regts.	1 Troop H. A.	4 Regts.

LAHORE DIVISION.

13 Stations.

3 Regts.	3 Troops H.A. and 7 Cos. F.A.	None	11 Regts.	2 Troops H. A. and 3 Cos. F. A.	5 Regts.

PESHAWUR DIVISION.

11 Stations

3 Regts.	2 Troops H.A. and 6 Cos. F. A.	None	9 Regts.	1 Company F. A.	6 Regts.

SIND SAUGOR DIVISION.

7 Stations.

1 Regt.	None	None	9 Regts.	1 Troop H.A. 1 Company F. A.	2 Regts.

BURMAH.

5 Stations.

2 Regts.	None	None	1 Regt.	None	None

PUNJAB FORCE.

None	None	None	5 Regts.	4 Batts.	5 Regts.

GRAND TOTAL.

18 Regts.	6 Troops H.A.	2 Regts.	127 Regts.	4 Troops H. A. 18 Cos. F. A. (Regular) 17 Bats. F.A. Irregular.	44 Regts. of Cavalry.

Thus in the extensive territory from Agra to the sea in a south-easterly direction the entire European force at our disposal was under two thousand men, the Native Army being at least sixty thousand. North-west from that station to Peshawur, the British numbered twelve

thousand to eighty thousand of the Native Army. The extraordinary disproportion drawn in these figures, especially in the Lower Provinces, would be truly ludicrous, but that it was so unhappily tragic.

Was it surprising, that it was said of us in some of the Native despatches intercepted after the outbreak, "The English Army is extinct." Assuredly, it was invisible. Was it surprising, that the Sepoy Army looking around, seeing no counterpoise to their own power, recognising their strength as we had taught them to use it, and vain of their renown, should, forgetting or under-estimating the value of the European element in their constitution, imagine that what they held so successfully and so long for the English, they could hold as easily and as well for themselves ?

As a matter of fact, not only is it easy to believe that they should think so, but it was an opinion which prevailed largely in England when the news of the outbreak first arrived.

It was said there, "How strange that this danger was not always more clearly apparent, how culpably unaccountable that it did not stare the most self-complacent in the face." Such were the first exclamations of the popular voice.

Flying to extremes, as is the wont of that clamor, the prestige of our name, the moral force of our supremacy which we had so long over-relied on with impunity in India, which was in truth the only ground of reliance we had, was now ignored altogether in England, and the project of giving up the Empire and retiring from a hopeless struggle was gravely and publicly advocated by a respectable minority of the English Press.

Whence had come this mysterious power, the "prestige" that had sustained our rule so long, and which weakened the hands of our revolted subjects even in the first hour of their anticipated triumph ?

It had been based upon the often-proved and admitted superiority of our fighting power over the people opposed to us. Upon that it rested. Upon that it would rest still.

But much as prestige can do, wonderful as its influence is, it is subject like any other force to be put to a practical test, and therefore, after we had neglected for many years to renew the sources of our substantive strength ; when our growing numerical weakness became more and more apparent, was it astonishing, was it not certain, that as material tone waned, moral force should wane also ? leaving us at last exposed to the attacks of those who saw in our failure their own natural and immediate advantage, and in our adversity their own certain opportunity.

This and this only was the cause of the Mutiny.

The annexation of Oudh on which so much stress has been laid was

the event which consummated the disastrous policy so long pursued, an which, when the train was fairly laid, precipitated the explosion.

A large kingdom, equalling in size the mother country of the invaders, teeming with an armed population, already supplying the bulk of the soldiers of our Native Army, was declared by a stroke of the pen a portion of our dominions, and we proceeded to display our title of conquest and to enforce our decree, by an addition, not to our British forces, but of some ten thousand men of the class we thus proclaimed our subjects, to the native troops, at whose interests and predilections we at the same time struck a decisive blow!

Surely, this was an extravagance of self-confidence, the very madness of arrogance.

But the evil did not rest here; when the feeling of the Native Army became fairly apparent to the various sections of the entire community, all classes partook more or less of the spirit of the Revolution. Naturally, both Hindoo and Mahommedan dynasties, that owed to us their decadence, strove alike to profit by our misfortunes.

The descendant of a Mahratta freebooter, rivalled in fierce hatred and ferocity towards us the last representative of the long line of Moghul Emperors.

The Nana of Bithoor and the King of Delhi, opposite poles of the Native Confederacy, alike shared the murderous spirit that wreaked its savage animosity on women and children of the detested British.

Some independent States, foreseeing peril to themselves in the spread of anarchy and the thorough success of revolt, declared for us. Some others wavered, but of our own provinces there was but one on whose fealty we had any reason to rely. That was the newly annexed province of the Punjab, the province where alone, as we have seen, a visible proportion of British soldiers was present to maintain their right of conquest, and the bulk of whose population bore deep enmity to the classes arrayed against us.

With this one great fundamental cause plainly carrying on its inevitable work, it seems as inconsequential and absurd to dissect stories like that of the greased cartridges, or to discuss trivialities in the regimental routine of the Native Army, in the way of imputing to such things any effect in causing the Mutiny, as it would be to seek to determine the law of storms by gathering up and analysing the shattered fragments borne before the blast of the Cyclone.

These things were the waifs of the tempest, not its cause.

But one of the most extraordinary, and one of the most unjust inferences ever drawn hastily from political events, was at one time deduced from those of 1857, in attributing those dire phenomena to the European officers of the Native Army, charging them with having wrought the calamities by their relaxation of the bonds of discipline, and having

by a neglect of their duty permitted their influence with their men to decline, the truth being that they had done their duty all too well. It was due mainly to their efforts, to the admirable organization, and the very state of efficiency to which they had sedulously cultivated it, that the Native Army owed its sense of power. An inferior force would have been less dangerous, less to be dreaded.

Can then the Native Army be too efficient, too carefully trained to excellence? Undoubtedly it can, for our interests, IF we have no counterpoise to its strength, for then we ourselves put the servant into the master's seat. The confidence of the sepoys in their own training and skill in arms, taught them by their British officers, was at the very root of the movement.

Putting this out of sight for a moment and also the consideration, that had there been any ground for the calumny that, as a body, the officers neglected their relations with their men, the Government more than the individuals would have been to blame; the whole history of after events goes to prove the direct converse of such a supposition.

Notwithstanding the extraordinary temptation that possessed the Indian soldiery to revolt, the apparently inevitable certainty of success if they were unanimous, so thorough was the hold, so marvellous the influence of those officers over the men, that in very few instances was Mutiny complete, in most it was hesitating and timid, and in some it was altogether quelled by that influence alone; and this was so in garrisons where the native soldiers were to their English officers as a hundred to one, where in the midst of a hostile population the latter were as rain drops to the ocean, and where there was no let or hindrance under God's Providence to unamenable rebellion but the personal ascendancy of the men who were once so maligned.

Take a single instance, that of the garrison of Saugor, Central India. Purely native (excepting about twenty artillerymen), isolated at a great distance from the possibility of European re-inforcement, it was plain and certain, that months must elapse before the troops if they mutinied could be disturbed or attacked.

A neighbouring State, Jhansi, was in the first flush of successful revolution. What was it then that kept this great majority of the Saugor garrison true to their foreign masters, but that personal ascendancy which was so curiously under-rated, and so gratuitously vilified at the very time it accomplished so much.

There was literally nothing else. But besides the active force thus exercised by the ten English officers over the thousand sepoys, there was a negative influence which was still more potent, and that was the loss to the Native Army, when it mutinied, of the leaders whom alone they were accustomed to obey.

These could not be replaced, for habit is to command what it is to obedience. The sense of responsibility suddenly imposed is certain

to perplex the unaccustomed mind. The doubtful hesitating command is sure to be disobeyed. Distrust of themselves was so palpable amongst the Native Officers who tried to lead the rebels against us, that a consciousness of their unfitness for authority quickly pervaded their followers, and desultory and uncombined effort was the final result.

If we suppose for a moment, that our Native Army had been from the first officered wholly from their own ranks; that the victories they had achieved, though gained side by side with European troops, had still been won under native leaders who had acquired the experience and influence of command, can we doubt that the mutiny of 1857 would have assumed far more formidable dimensions?

The idea, not unknown to us, that it is our duty voluntarily to renounce our own interests, by deliberately placing ourselves at a disadvantage with inferior and hostile races, for their benefit, in giving them that experience and influence of command, may without argument be relegated to the limbo of shams with which plain practical common sense has nothing to do.

Taking for granted, therefore, that we desire to keep our Indian Empire for ourselves, though we would rule it to the benefit of the people; taking for granted, that we want an Indian Army for our purposes and not for their own, the conclusion we are forced to is that its leaders should be ourselves, and that the English officer with a native regiment should be now what he was in 1857, our mainstay with that section of the force which maintains us where we are.

In that year the tide of rebellion was actually stemmed, if not turned, before a single English soldier of the re-inforcing army could share in the conflict. The advance of Renaud's detachment and Neill's column was made before the first instalmeut of the troops diverted from China could reach these shores, and successful as the after sweep of conquest was of Havelock and Lord Clyde, the first impulse of victory was given before they appeared on the scene.

And this was due under Heaven to the indomitable fortitude and courage of the English officers and men who faced the fierce danger first, to that spirit of heroism, which whether displayed in a solitary and individual instance like that of Frank Gordon of Abergeldie, who died alone at Jhansi after killing twenty-five of the enemy with his own hand, or that of a leader like Henry Lawrence at Lucknow, who animating every soul of his party with his own invincible resolution, forgot nothing that could serve his country, yielded nothing to its foes but his own life, can never be thought of surely without producing a thrill of admiration and pride which is almost reverence.

From these considerations we deduce, that the number of European officers with our regular Native Army was one of the elements in its constitution most favourable to our interests.

This view is further corroborated by the fact, that where the Irre-

gular regiments, *i. e.*, those officered by but four or five Englishmen only, did mutiny, they did so far more completely, and they were far more formidable adversaries than the Regular Army; more completely, because they were less under British influence, and they were more formidable, because they had a certain leadership ready to their opportunity.

The Gwalior Contingent and the Oude Irregular Force are instances in point; they rose unanimously and *en masse*, and the former achieved the only success the mutineers can boast of in the open field in the action before Cawnpore.

The Irregular Troops that did not mutiny were composed of classes already at bitter feud with those of the Regular Army.

The admitted efficiency and utility of the Punjab Irregular Force are often cited, to show that the system of employing only a few selected officers with native troops is a good one. It should be remembered, that no parallel circumstances are afforded in the position of that force, as compared with that of the old Native Army. It is in number a mere fraction of the latter, whose magnitude was a danger. It has been in existence but one-fourth of the time of the latter, whose age was a danger. It is not concentrated in overwhelming proportion in great cities, the foci of great kingdoms, like the latter, whose distribution was a danger.

It has never in fact stood, nor could it be expected to stand, in anything like the relation to the Empire at large, as that Army did to which it is compared.

In campaigns of any magnitude it has been invariably re-inforced in great proportion by the British troops, Goorkhas and native regiments of the line. This was the case even in the last unimportant expedition in Hazara; and admirable as the Punjab Force is, it is not on a scale which justifies reference to it as a standard in considering the present subject.

It should be remembered, that the system which officered our Native line regiments was one of slow growth; it may be inferred that this growth depended upon the necessities shown by experience; that it was practically discovered that where five British were good in action, ten were better, and twenty better still; and thus in fact from what was originally the "irregular" system, the "line" system gradually developed; and to ignore the results of that very long and very practical experience, and to jump to the conclusion from reviewing the events of 1857, that because a regiment has few British officers it is better than one with many, seems like believing that the key stone of an arch is a defect of structure in a building whose foundations have been shattered by an earthquake.

In reverting then as we have done to a system we had outgrown, we are committing a grave error; one too, which if reasoning is not wholly at fault, lies on the surface.

That the presence of English officers with a native regiment is a positive and material advantage, (and it is difficult to comprehend how it can be otherwise) seems to be still allowed; inasmuch that in war the number of officers is always temporarily augmented as far as possible, that is to say, no sooner is the Native Army employed in its professed and normal avocation, fighting, than an approximation to the old line system is at once made.

But such augmentation, though better than nothing, is surely at best but a palliation of an evil which need not exist, and which we have created without any apparent object. It is obvious that the services of officers thus employed with strangers will lack some of the value which long regimental association alone confers.

Mutual respect, confidence and attachment between men such as may exist, such as do exist, despite of difference of creed and color, do not grow up in a day; that they are of the very first importance between soldiers and their officers, no military man will deny; and in any system which does not foster them, there are seeds of mischief which will certainly develop under natural and inevitable laws.

The old regimental system did foster them, they abounded in the old Army; they could not, it is true, arrest the flood of the political events we have reviewed, any more than a breakwater can stop the spring tides; but when the waves of revolution broke over the land, they did much to fend the shock and they saved many lives.

We have destroyed the regimental system, one which as we have seen grew out of practical needs, one which the experience of all nations has adopted as the best form for their military purposes.

With what have we replaced it? We have first of all diminished the strength of our most valuable materials, and we have next placed those diminished materials in such juxtaposition as shall afford them the least mutual support and cohesion.

Finally, concluding the comparison of the old Army with the new one. Supposing the latter were placed in precisely the same circumstances as the former. Supposing we were to reproduce now the political position we occupied immediately previous to the mutiny. Supposing we sent home to England two-thirds of our present force, and that we were to place in the hands of the *present* Native Army, the number of cities, forts and cannon then confided to the sepoys, does any sane man believe that a superiority of quality or of system now exists in the Native Army of the present, which would ensure the permanence of our Empire, not for a century, but for a month?

But if that superiority does *not* exist, then all arguments which base the rebellion on the defectiveness of the former Army fall tothe ground; all the clamor which shrieked for change, any change, which cried out at the old beliefs, the old traditions, the old ways, "away with them," all this was a vain and empty clamor, and it would seem that instead of turn-

ing our misfortunes to account, dispassionately enquiring into their causes and calmly remedying the defects which gave them birth, we have rushed to hasty assumptions and to still more hasty remedies, and have now the task before us, first of removing the badly designed and badly executed portions of our late work, and then the re-construction of a fresh edifice.

If this is so we should not shrink from it now.

While it is impossible to suppose, that the number of English officers with native regiments might not be increased to at least the proportion formerly established in the old Indian Army with the very best result, it is not difficult to demonstrate, and it will be presently shown, that the European system of discipline, interior economy, and even drill, as practised in English regiments, may be very easily overdone, and that some valuable military qualities our present native soldiery possess may be "improved" out of existence, by a too rigid rule of thumb, which should seek to assimilate, too closely, systems dealing with dissimilar materials.

A spear is not more unlike a hatchet, than is the Asiatic soldier unlike the British private, and the rules of art to be laid down for the exercise of weapons differing so widely in make and temper, cannot properly nor usefully be the same.

Therefore it would follow, that the British officers with the Native Army should have some special training and education for that work, in other words, that they should be appointed young, and brought up to their particular vocation as for any other profession.

This is again but a truism, one universally acknowledged in every trade and calling which men follow.

It is however, necessary to bring it forward, when we find in dealing with our present subject, this, as well as most other truisms, systematically ignored or even derided.

It will be remembered, that one of the chief points vulnerable to the reformers who most persistently attacked the old system, and one which was always most vehemently denounced by them, was the filling up of the appointments on the staff (including in that term all the various employments other than regimental the necessities of the State demanded) from the officers of the line regiments. The evil was argued and dwelt upon, that must necessarily arise from the paucity of officers with their regiments (although in no instance was the number ever reduced to the present maximum;) the disadvantage of tempting the most promising officers with a regiment, to leave it for a more lucrative and advantageous career in other directions, was forcibly brought forward, commented upon, and inveighed against. No system could be worse, it was said, and there was enough truth, and more than enough plausible sophistry in addition, to reduce its defenders to plead necessity as its chief excuse, there being no other available source of supply for the demand.

It might be argued here, perhaps, that after all this well abused system worked out practically very well, and that where, as in its case, a measure is the result of plain and urgent need, it is generally far better in all respects than any evolved from theory. But passing that by, we find the only provision in the new system for providing officers for the future Indian Army, repeats the evil of drawing them from other regiments.

Henceforward, it is from the British regiments that the supply is to be drawn !

It may be said that the vacancies so created are filled up at once and so the regiment does not suffer, but it has never been proposed to add to the establishment of officers, or even to attach temporarily an additional number of young officers, destined from the first for the Indian service, to supply the drain. It is to be drawn, *i. e.*, deducted from the present regimental establishments, and thus we have at best, untaught youths constantly supplying the places of men who will be removed just as they become efficient ; and, if the design were ever really carried out so completely as to fulfil its avowed object, the regiments would become so many schools for young men wherewith to spend a certain term of their education, and with which in all other respects they would have no concern nor interests, and the young officers of every British regiment in India, instead of being brought up to take a pride in it would be unhealthily stimulated to seek their advancement elsewhere. That this system can be other than a mistake, as far as these regiments are concerned, (and these regiments constitute the back-bone of our power,) is scarcely conceivable.

But there are already certain signs that the number of officers so provided will be greatly insufficient. Already the younger grades for the Indian service are showing gaps in their ranks. Of Major Generals and Field Officers we have abundance, but we miss a large proportion of the youngsters who are certainly *as* useful in their way.

It will be answered, perhaps, that already the applications for admission into the Staff Corps are more numerous than can be complied with, and that there are not sufficient appointments to afford employment to the members of that corps as it stands. That may be the case at present. If so, it is partly owing to the reduction of the European element with the Native Army which we deplore, and partly to the great preponderance in number of the older officers, who are many of them filling situations better fitted for younger men.

It is for the future that no adequate provision is made.

The question is, whether the preparatory school training in a British regiment is so important a part of the education of an officer, desirous of serving for the rest of his career with the Native Army, as renders it advisable to overlook the evil which will ensue ?

Will the new plan give us better officers than we have had ? It will be surely, a list of names brilliant indeed that shall eclipse in the

future, those which the old Company's Army formed and which are inscribed in the scroll of Fame.

If a Native regiment be a bad school for a young officer, then some of our most distinguished soldiers have contended against a singular disadvantage. Let us suppose then the Native regiments of the future so officered that there shall be two English officers, a Captain and a Subaltern, to each company, the present complement of Staff Officers, a Major and a Licutenant Colonel—let us suppose that these officers have served with their regiments from boyhood, that in each and all is an intense *esprit de corps*, a pride in its renown, a strong attachment to, and a lively interest in their men, that the older officers are veterans grown grey in war and experience with their soldiers. In the name of common sense would such an organization be a bad one ?

Yet, that was what we had before. Again let us suppose that these native regiments were invariably brigaded with a proportion of one to three of English regiments, taught to vie with these latter in all true soldierly qualities of spirit, bearing, and discipline, that the officers of both were encouraged to contend in noble emulation to excel in all the branches of skill, attainments and accomplishments of their mutual profession, that instruction practical and theoretical were systematized, that large bodies of troops with natives were habitually massed at points of strategic importance, and carefully and sedulously trained together in tactical operations on an extensive scale ; that the combination of the various arms was made a subject interesting and instructive to every officer and soldier, European and Native, by constant and intelligent exhibition ; that the practice of isolating Native regiments for police purposes in out-of-the-way solitary stations, was utterly done away with ; in short that the combined Army of India was kept like a good sword, at the highest pitch of temper, polish and sharpness ; *then* we should have what we had not before, and mutiny to such an Army would be as impossible as defeat.

A question next arises of the Staff requirements of the Army of the future. It will be necessary to discriminate these, from the various offices now held by Military men in departments of the State unconnected with the Army in any way. Permanent employment in a civil capacity should be erased from the list of appointments to which regimental officers, as such, are encouraged to aspire.

The Army Staff may properly include only those departments that are indispensably connected with the Army, and the tenure of all these appointments to it should be terminal at fixed periods. If the Commissariat, for instance, be still retained on the Army Staff, it would be of benefit that the experience gained in it should be diffused among the regimental officers generally ; the Judge Advocate's Department might follow the same rule ; so with Cantonment Magistrates, and in fact where the duties, though civil in their nature, are still inseparable from, and owing their existence to, the Army, they would be advantageously

performed by officers who could not be, and should not be, permanently separated from their regiments for the rest of their lives. The Adjutant General's and Quarter Master General's Departments would remain subject to the present rules.

Where however strong personal bias, special gifts and attainments, or marked qualification single a man out for a political or purely civil career, permission might be granted to such an officer to retire from his regiment altogether by appointment to a Staff Corps established for that especial purpose, his place being filled up and promotion made in his room. This list of Civil Staff would include all employments, as Supervisors of Forests, Inspectors of Education, the Civil Commission, the Revenue Survey, and all posts not directly connected with Military affairs.

There would be as at present, two careers open to the young officer, each with its own incentives to ambition ; the one purely professional, in which whatever Military Staff avocations might be found for him, he would be always a regimental officer, the other unprofessional, in which the individual selecting it on leaving the Army should no longer stand in the way of promotion of those with whom he has practically severed his connection, but become and remain of a separate class having its own proper pursuits, grades and ranks. Thus there would be no clashing of interests, no heart-burnings at superior good fortune.

All Army Staff as described, being appointments held for a limited period, each officer not absolutely disqualified, would at one period of his service hold one at least, and the class distinction as between the regimental and the Staff Officer, of which we have too much, would disappear.

The eliminations of all nominees to the Civil Staff from the regimental lists, would tend also to check the over-retardation of promotion, which was one of the greatest drawbacks to the old Army. The purely military element in the community would thus too become concentrated, and the Army would have a compactness, a solidity, and a coherence to which it is now a stranger. The dissemination of special experience amongst the entire body of regimental officers, all of whom will at one time or another have served in one or more departments of the Staff, would do much to enhance the value of their services to the country and to elevate and enlarge their professional ideas.

Reverting to the primary importance, that the education of the officer who is destined for service with Native troops should be special, and adapted to the peculiar requirements of his position, the instance of the old Native (Regular) Cavalry may be cited.

From a want of discrimination in the method of adapting a system to the materials given, partly in fact to ignorance of the nature of the materials with which they were dealing, a very great mistake was perpetrated in the construction of this force by those who formed it. The Indian Light Cavalry under Native leaders, and with an organization, equitation, and exercise of arms peculiarly their own, has been for a very

long historical period known as a highly valuable and efficient force. The Rohillas, descendants of Puthans who overran and colonized Rohilkund, were as famous on the side of the Mahomedans, as the Mahrattas of Central India on the side of the Hindoos, for excellence in horsemanship and skill with the sword and lance.

In some essential respects it may be doubted if European Cavalry in any age has equalled the Indian.

This arm has always been a favorite with Asiatics whose greatest battles have been won by its agency.

The bitting and instruction of the horse, the shape and materials of the saddle, and the lightness of hand and sharpness of blade of the rider, were for purposes of personal combat, whether singly or in bodies, as near perfection as could be attained. It is nothing to the purpose, no argument to the contrary, that they have been defeated by British troops, for moral causes are as powerful in deciding a battle as physical, and the Asiatic is, as a combatant, inferior to the European. As before pointed out, this fact is at the bottom of our presence here at all. Whether it arises from superior courage, or strength or stubbornness, or a combination of all three, matters little, the fact is incontestible and uncontested. But the skill is, (or was), also as a mere matter of physical excellence quite as incontestible.

In any case the attempt to educate away that excellence and to substitute a system, which was assuredly inferior having regard to the material, was fraught with mischief.

We could not give the Rohilla nor the Maharatta the stubbornness of fight or whatever the moral quality may be which wins, so we blunted his sword, we changed his sharp bit for one with which he could not hold his horse, we took away his broad pad of a saddle to which his spare limbs naturally clung, and we put him on a hard slippery angular contrivance in which, though we could succeed in teaching him to balance himself, he never rode; and in short, we very soon metamorphosed a useful and efficient Cossack into the ludicrous travestie of an English Dragoon. War, the stern teacher, speedily pointed out to us the mistake we had made, and therefore though we still kept up a system shown to be wrong, we raised a much larger force of Cavalry, retaining many of the admirable points of the native organization and equipment.

This was designated the Irregular Cavalry, and as to the fitness of that force for its purposes there will be no dissentient voices amongst those who have ever served with it.

There are now however indications that the tendency to anglicise (*i. e.* to level to a certain British standard, admirable with British soldiers, but in many respects unsuited to Asiatics,) all details of Military organization is still at work in a wrong direction, and that this tendency

will, unless checked, render the Indian Cavalry of the future again a bad imitation instead of a useful and efficient original.

To illustrate this let us take the instance of equitation alone.

Regard must be had to the difference in size and weight betweer the Englishman and the Asiatic. The former trusts much to hs strength, the latter wholly to his skill and address; the one trains h- horse like a hunter, the other cares only to gallop in a circle of whi his spear point is the immoveable centre. The English trooper's cha ger is taught to extend himself, the Native horse is ever thrown on haunches. Our Veterinary Surgeons tell us that, this last system r the horse's hocks, but no native would think a spavin a serious dra back to the value of an animal trained to carry his rider to the left ha of his foe with the wheel and dash of a hawk; and from his point view he is right.

Who that has ever seen a Rohilla, weight six stone, handle hi horse at the native sword exercise, with a touch on the rein that woul not move a weight of half an ounce, could ever dream of putting hi for improvement into an English manege.

Perhaps a necessary evil, certainly an invariable accompaniment oited all military pageantry, is an over-attention to points of mere displa his Periods of peace are so much longer and numerous than those of wamen- that men are apt naturally to study the attractiveness of appearanear. which recommends in the former, than the severely useful requiremen of the latter.

But it is well ever to bear in mind, that it is for war and not purely peace that armies are raised and maintained, and the standard of cirated, cellence for Light Cavalry should be the celerity and order in which ice to can be moved at the inspiration of its commander, to that place in thrience field whence its swoop on the enemy can be most effective, rather that one the trueness of its line in passing in review, the rythm of its horse's fe Staff, as they trot past to a jingle of spur and bridle, or the acuteness of thry and angle at which the horsemen's cap can be placed at the side of the hea without falling off.

With regard to the Native Infantry the present material is on th whole superior to the former. A large proportion of it is now recruite from the North-Western Frontier, and the tribes from which it is draw are more essentially warlike in character, possess greater physical strength and are far less hampered for military purposes by caste habits and prejudices, than the class which they have to a great extent replaced Their drill is now more simple, and more practical than it formerly was and their dress and arms are improved and improving.

The present arrangement of mounting all the European officers wit a Native Infantry regiment is not a good one, and in the event of an increase to their number, it would become of course more inconvenien than at present. In war, especially in hilly countries such as we ma

anticipate, foot soldiers should be mainly and immediately led by officers also on foot. The number of mounted officers provided by the regulation of the English Army with an Infantry regiment is ample for all practical purposes.

But the point of most importance now to be regarded is, perhaps, the inculcation of the maxim that it is by combination that the successes of all arms are achieved, the insistance on the fact that regimental drill and organization have for their main object the establishment of the value of each individual corps, *not* as an unit but as a component article of a great machine.

The regiment is most valuable to its brigade, that brigade to its Division, and that Division to its Army, which possess the greatest mobility, the greatest power of swift and intelligent conforming to the tactical plan of the whole.

As a rule the zeal of the regimental Commander is more conspicuous in a somewhat exclusive study and cultivation of battalion drill, than in the far more essential practise of the exercise of large bodies.

How often one hears it said that Field days rather tend to unsteady soldiers than to improve their drill. But this is the very strongest argument that can be used in favor of Field days, that they should be repeated until they do not unsteady the soldier, for however well-drilled a regiment may appear to be on its own private parade ground, if it is not equally steady when brigaded with other troops its efficiency for service is manifestly imperfect.

And this is yet another argument for increasing the number of European officers with every native regiment.

Few native officers have the power or the habit of mind necessary to apply a knowledge of parade movements sufficiently rapidly and skilfully, to render them reliable in the execution of combined field manœuvres on an extensive scale, nor is it advisable that they should have them.

Finally, to sum up in one comprehensive view the necessities which appear to belong to the position of the Native Army of the future, we would state them briefly as follows. The furtherance of British interests will be best accomplished by the infusion of the British element into its composition in the largest possible proportion, the larger the better. The re-establishment and the constant fostering of an *esprit de corps* in the class, the body of English officer so devised and created, that its career, its interests, and its ambition shall be bound up with and inseparable from the Native Army it is destined to lead, will be as before the surest basis for the permanency of our power ; and the training of that class not only in the principles of its profession but in the special knowledge which its duties render imperative, will be the most certain guarantee that the purposes for which our Native Army is called into existence

viz. the extension of our Empire and the maintenance of our renown, will be adequately fulfilled.

His Honor the Lieutenant-Governor then moved a vote of thanks to Major Cory for his interesting paper, and the meeting was adjourned till Wednesday, the 20th July 1871, to enable Members to prepare for the discussion on the important subject of his paper. A report of this discussion will be published in the next number of the journal. Meanwhile opinions are invited from Members at a distance.

DEBATE.

On the 13th June 1871 a meeting of the United Service Institution India was held at Simla. At this the following were read by the Secretary. The lecture on the "Education of Staff Officers," delivered in the Theatre of the R. U. S. Institution in London, by Major Alfred Jones, V.C. Extracts of the Reports of Baron Stoffel's Reports on the Prussian Staff, published in the *Times* in March 1871. As several members expressed a wish to make some remarks on the subject before the meeting, the lateness of the hour did not permit of their doing so then, the meeting was adjourned till the 20th June, 1871. When Major O. T. Burne, addressed the meeting as follows:—

I have no right to occupy much of your time by expressing lengthy opinions on the important matter which we are invited to discuss to-day, the "Education of the Staff Officer." It is however a question on which all Military Officers must take great interest, and I am therefore anxious to say a few words on the subject.

I confess to a feeling of disappointment in reading Major Jones' lecture, because however ably his arguments are put, they merely amount to a defence of the Staff College system, and do not therefore in my opinion treat this question on sufficiently broad grounds.

For myself I rather hesitate to accept the belief that Staff Officers, in order to become perfect, can be educated only at Sandhurst.

There is much good sense in many of Major Jones' remarks, and it is only natural that he wishes us to accept the present Staff College system (in which he takes a prominent part) as the one and perhaps the only one by which we are to attain that perfection which he thinks to be so desirable. I venture to disagree however to some extent with that system, and would briefly explain my reasons for doing so.

Gentlemen, as regards the Army, we are somewhat a nation of theorists; we are not practical. Let the matter be Control, Camps of instruction or anything else, we have never been able to organize, nor fairly grapple with, either the constitution or management of our Army, nor what is to my mind still more important, the education of our Officers.

What are our requirements as to the education of Staff Officers, and how does our present system meet them?

Our requirements are really simple. Perhaps many of you may agree with me that the essential ground-work for a good Staff Officer is that he should be, speaking in general terms a gentleman, a bold rider, active in his habits, of calm temperament, a fair linguist, able to sketch, survey, write a good hand, and compile a report.

As Sir G. Wolesley, in fact, has truly said in his little book recently published, "A man who cannot bear fatigue, who is not of active habits

"and who cannot ride well, is useless as a staff Officer. Being a good "sportsman, a good cricketer, good at rackets, or any other manly game "is no mean recommendation for Staff employ. Such a man, without book "lore, is preferable to the most deeply read one of lethargic habits. "The worst Staff Officer I knew in the Crimea had taken the highest "degree in the Senior Department at Sandhurst. I do not wish to "insinuate that learning is injurious, but to prove that scientific "attainments alone can never make a good Staff Officer," Major Jones also points, in his Pamphlet to some similar essentials, that must necessarily be found in a good Staff Officer.

He infers, as far as I understand him, firstly that a bad Regimental Officer can never make a good Staff Officer; secondly, that more practical training in the field is required; and thirdly, that the essential element of riding requires more consideration than has been hitherto given to it.

Now Gentlemen, conscientiously agreeing as I do with Sir G. Wolesley, and in what is I believe inferred by Major Jones, in regard to the *sine quâ non* for the selection of a Staff Officer, I wish to show briefly how our present system seems in my humble opinion, to fall short of what is really necessary.

I had the pleasure of reading the other day the Staff College Examination Rules for this year. Although there is a marked improvement in them as compared with the rules of former years, yet I believe them to contain more theory than practice and not to be calculated of themselves to turn out the kind of Staff Officer we require. The rules read well, and comprise much that is valuable, But taking the Entrance Examination alone, it is too much one of book competition, without sufficiently practical tests of the canditate's fitness for Staff employ.

The effect of this system tends to attract what we may call the bad just as much as the good Regimental Officer.

Let us for the sake of argument suppose that the good Regimental Officer is one who is a good sportsman, a good rider, who thoroughly understands his men, is full of *esprit de corps*, and whilst studying in his spare hours what he ought to learn, yet makes book lore subservient to activity; and let us suppose that the bad Regimental Officer is the reverse.

When it comes to one set of attainments being tested by competition book examination, and the other by certificates of little practical value we may fairly suppose that book lore has the advantage in gaining an entrance into the College.

Again the course of education at that institution has of late years tended to a course of abstract subjects, which rarely serve us in time of need rather than to practical tests in the habits and duties which are necessary for a really good Staff Officer.

Camps of instruction are therefore much better Staff Colleges than those we possess under the present system; or at all events they should

cessary appendages to the selection of Officers who are worth further ation at a Staff College.

If the country is put to the expense of a College, the only just mode of defraying that expenditure is, by a few simple rules, to admit to it only those Officers who are by practical tests found likely to succeed as Staff Officers.

If Camps of instruction are conducted under properly organized rules, supervised by competent Officers, and attended by as many Officers of the Army as can posssbly be spared, whether their Regiments are in Camp or not, there need be no difficulty in ascertaining in a few months those who are capable of being good Staff Officers, who excel in riding, who are fond of active exercises, who are of powerful physique, who can sketch the surrounding country, who can compile a report or carry an order.

Any General Officer, in communication with Officers Commanding Regiments, and with little other assistance than a steeple chase course, a cricket ground, a lecture hut, a small sum of public money for prizes, for riding, sketches, or even reports, &c., and a few well-devised field days in which both Officers and men should previously be made to understand in published Camp Orders what they are going to do and afterwards informed what they have not done—I say, any General Officer ought to be able to establish a system, too simple to require description, by which he could test the capabilities of every Officer in Camp. Were a list of selected names recorded at the head-quarters of an Army at the end of each camp season, and selections made alone, except in especial cases, from that list for Staff employ or Staff College education, we should soon have plenty of good practical material for our Staff. But this would necessitate a change of system in the College itself. If riding and languages were put first and chemistry last, it might peradventure be an improvement. We should not insist either on such a long residence at the College, nor on such a difficult competitive examination at the end of it, nor on a three months' duty with some particular branch of the service to learn what takes an ordinary Officer many years to acquire, and then turn out what we imagine to be a ready-made Staff Officer. We should rather restrict the residence to a shorter period, form the College into a higher and lower branch, make the higher branch optional, but not allow any Officer to enter it unless he had been a year in the lower, and had subsequently served with his Regiment for a like period.

It is a mistake to pitch the compulsory education of a Staff Officer too high a theoretical standard; but at the same time the optional study of *ologies* may do an Officer no harm as long as he be not allowed to waste too much time over them, or to sacrifice practical training in the field and in his Regiment on their account.

Gentlemen, not wishing to trouble you with too much detail, I have only touched lightly on this interesting question. I only wish now to sum up what I have intended to show, *viz.* that the basis on which we found our estimation of Staff education is too high flown and theore-

doors. The appointment of Garrison Instructors I regard as far mo practical and sensible than if many more professors were added to thuld be Staff College. If the system is worked by real soldiers with them the whole hearts in the work it cannot but do immense good. There is one thing too which holds by far too great an extent in our army, *viz.* once may on the Staff always on the Staff, I think far more circulation is necessar Army and that after every three, or at most five years, every one should get the back. Short service is now regarded as the proper rule for the rank for and file of a national Army and I think it should be the rule to some extent for the Staff. There is no doubt that the more practically educated officers you have in your army the better, but I do not see how this can be attained if officers are re-appointed again and again to the Staff, and while I would limit the term of service in the Staff, I do not want to create an idea that five years is every man's right. This idea is exceedingly prevalent now-a-days, a man goes to a Staff appointment and with a sigh of relief settles himself down for five years of it, whereas he should I think understand that if it was not for the interests of the service he should not remain more than a week: yet I think that it is decidedly for the interests of the service that a man who has proved himself an able Staff Officer should be re-appointed after having done some duty with his regiment. I would also like to see every restriction taken off the appointment of Engineer and Artillery officers to the Staff of the Army. I think too that officers of the Indian Army ~~should be~~ given exactly the same opportunities of improving themselves as is afforded to officers of the Home Army.

In conclusion I will say that I should like to see officers qualifying for Staff employ more for the opportunity it offers them of improving themselves as practical soldiers than for the sake of the pay attached to appointments."

Opinions on this important subject are invited. Such as are sent, will be published in the next number under head (d) of Rule 3 of the Regulations.

NOTES.

On the necessity of an Army receiving a tactical training and on the practical advantage of Camps of Exercise.

I.

No one can doubt but that the extraordinary success of the Prussian troops in Bohemia in 1866, and again in France in 1870, is mainly attributable to the care and attention which has been paid for years past to their practical training.

2. In the former war great stress was laid on the effect of the needle gun, and now we hear of the superiority of the Prussian Artillery, both no doubt assisted materially in gaining such unprecedented triumphs, but as the Artillery of the Austrians was better served and more effectively used than the Prussians, and as the Chassepôt is pronounced to be a better weapon than the needle gun, it is evident that the fate of battles does not depend alone on the superiority of arms, but that victory will be on the side of the nation whose troops have had the best tactical instruction.

3. The introduction of arms of precision has rendered such instruction more than ever necessary; it has changed the whole art of war, and has immeasurably increased the value of individual skill and intelligence.

4. It is easy to understand that the old order of battle will not now answer, far-reaching guns and rifles preclude the possibility of supports being drawn up in close columns immediately in rear of the first line, or of reserves being massed within any reasonable distance, except where the ground is peculiarly favorable and offers sufficient protection. Assistance at a critical moment may therefore be impossible; either it will be found that the supports, in their anxiety to escape from the fatal effect of their enemy's fire, have forced their way into the line of skirmishers, or that they have withdrawn too far to the rear to render the necessary help.

5. To meet this inevitable change our soldiers must receive a practical training, they must learn to appreciate the value of their own particular weapon, and to feel that victory depends on their individual worth and skill; in fact they must be taught that battles will in future be won, not so much by numbers as by tactics and scientific attainments.

6. This feeling of confidence and independence cannot possibly be gained on the regimental parade ground, where of necessity more attention is paid to technical than tactical training; and to instil it thoroughly through all ranks it is essential that regiments should be exercised together, and that each branch of the service should learn to recognize the value of the other branches, for without a due appreciation

of the capabilities of the several arms, that mutual assistance and support which one is to the other, and that happy combination of all, so indispensable to success in war, can never be properly understood.

7. Moreover unless troops are in the habit of being exercised together, both officers and men are naturally inclined to think too much of their own particular service, and to fall into the fatal error of trusting implicity to it, forgetting that each branch has its own special duty to perform, and that he alone can be a good commander, who knows how and when to employ each and all to the best advantage.

8. That the British Army in India is of necessity large, but considering the vast extent of country to be guarded, and the peculiar complications which may at any moment arise, it cannot be said that we have a man too many, or that the Force is even large enough unless each unit of it is armed and equipped in the most efficient manner, and each individual soldier carefully trained.

9. Fortunately the nature of the country admits of this training being carried out in the most complete way ; for many months during the winter the climate is all that could be desired ; large tracts of land exist well adapted for military purposes, and for which little or no compensation would, at that season, be required.

10. By selecting the locality with due regard to the proximity of troops, by the adoption of small light tents which would afford ample shelter in the dry winter months, by reducing baggage to the weight allowed on actual service, and by making use of moveable column carriage, so far as circumstances would admit, it would be quite possible to organize a camp of exercise for 20,000 men every cold weather without incurring a very considerable expense, certainly not more than should be cheerfully granted when the incalculable advantage to be derived from the outlay is considered.

11. In a camp of exercise every thing ought to be carried on as if on actual service. Two *corps d'armée* should be organized precisely as in time of war, and, after a short interval spent in preliminary exercise, one corps should be required to manœuvre against the other, the Commanders being left to carry out their own tactics. In fact from first to last, except in the shedding of blood, there should be all the reality of war.

12. In this way and in this way only can an army be educated. The most perfect machinery will break down if allowed to rust, and so will the finest troops in the world whose military training is confined to the barrack square.

13. Difficulties must be expected whenever troops first take the field, and it is to reduce these difficulties to a minimum and to prevent the probability of their occurring in war time, that camps of exercise are so essentially necessary.

14. In these camps the thoughts of all real soldiers will be drawn towards the more practical part of their profession, and they will be interested in seeing that their corps are kept to the mark, and in endeavouring to remedy whatever may be amiss. Officers of intelligence and gifted with military genius will necessarily come to the front, and grand opportunities will offer of selecting men the best fitted for commands and staff employ.

15. The Infantry Officer will see the vital importance of husbanding his ammunition, and of keeping his men under cover whenever practicable, and will very quickly understand, that the lives of valuable and highly trained soldiers are not to be uselessly thrown away, by trying to do what should be, and can be, more effectively done for them by their friends in the Artillery.

16. The Artillery Officer will discover that something more than mere technical gunnery is required, and that, if he hopes to take that share in the battle, which the excellence and overwhelming power of the weapon entrusted to him demands, he must combine with his knowledge of gunnery, a tactical eye for ground, so that he may be able to bring as many guns as possible into action, and to place them where their fire will be most effective. To the experienced Artillery man, nothing ought to be impossible, nothing ought to be even difficult.

17. The Cavalry soldier will learn the important part which the mounted branch must always be destined to play in war, he will become familiar with outpost duty, and with reconnoitering in an enemy's country. He will perceive the necessity of energy and dash in all his movements and will appreciate the fact that Cavalry leaders must be prepared to act on their own judgment, and that the efficiency of the Cavalry service mainly depends on the genius and talent of the Commanders.

18. Nor will opportunities be wanting for the Engineer Officer to study his profession. Bridges will have to be thrown across rivers; batteries and entrenchments will have to be constructed on short notice, and perhaps under a heavy fire, and fresh obstacles and difficulties will have to be continually encountered, the ready mastery of which will distinguish the soldier Engineer from the mere mechanic; in short the Engineer Officer will not fail to see that theoretical knowledge is of little use without practical experience, and that man who is never at a loss and who can make the most of resources at hand, is of infinitely more value to the Commander than one of greater attainments, who cannot bring his talents into play at the right moment.

19. Before the date fixed for the formation of the Camp, all points of detail should be carefully considered, so that as little time as possible may be spent in preliminary arrangements after the troops have assembled. This is necessary both on the score of health and economy.

20. The several *corps d'armée*, divisions and brigades should be organized, and the part each is to take in the mock war should be de-

termined. Maps of the country in which operations are to be carried on should be freely distributed; the kind and description of tents and the number to be allowed to each unit should be decided, the weight of baggage for the several ranks should be laid down, as also should the amount of ammunition to be carried with regiments and in reserve; in this way the working of the Ordnance and Army Commissariat Departments, both in regard to supply and transport, would be practically tested.

21. Nor should the hospital equipment be omitted. Extensive arrangements as on service will not of course be necessary, but it is very desirable that Medical Officers, both administrative and regimental, should have the benefit of practical training; small field hospitals should therefore be formed in convenient localities, where all men requiring treatment should be conveyed. This would enable the various descriptions of ambulances to be tested, and the best way of carrying sick and wounded soldiers to be determined.

22. The telegraph and postal arrangements should be entirely under military control, in order that the camp may be as complete as possible in itself, and that officers may gain experience in the organization and working of these departments, and during the summer months a certain number of men in every regiment likely to join the camp should be instructed in signalling; the provision of the necessary apparatus, and the construction of the required lines being left to the Royal Engineers.

23. For the Postal service no preparatory training appears to be necessary, the bags for the several divisions and brigades should be made up at the nearest Post Office, and forwarded to the Head Quarters of the Force, where they should be distributed under arrangements to be made by the Quartermaster General's Department.

24. As only a limited number of regiments can after all be annually collected in a camp of exercise, leave should freely be given to officers serving at a distance, who may be desirous of witnessing the manœuvres. Suitable work could no doubt be found for all such. Some might be employed as orderly officers, or in the Pioneer and Engineer Corps, while others might assist in the Telegraph and Postal departments, or in surveying and obtaining intelligence under the orders of the Quartermaster General.

25. It would be scarcely possible for an officer to pass even a short time in such a camp without acquiring much useful information, and he would return to his regiment or station with greater zeal for the service, with an eager desire to profit by the experience gained, and with a determination to study the art of war and thus render himself better fitted to take part in the operations of the ensuing year.

FRED. ROBERTS, *Lieutenant Colonel,*

Royal Artillery.

II.

IN order to do away with the present difficulty of distinguishing the different Staff Departments of the Army, I venture to propose that they should be distinguished by the colour of the puggree, so that he that gallops may read; and with this view I append the following scheme:

DEPARTMENTS.	DESCRIPTION OF PUGGREE.
1.—General Officers (including Brigade Generals) ...	White.
2.—Adjutant General's Department	Broad Red and narrow White Stripes.
3.—Quarter Master Generals ...	Broad White and narrow Red Stripes.
4.—Brigade Majors (including Station Staff Officers) ...	All red.
5.—Personal Staff (including Secretaries and Interpreters) ...	Green.
6.—Engineers (including Executive Engineers), ...	Garter Blue.
7.—Medical ..	Black.
8.—Commissariat ...	Yellow.
9.—Judge Advocates ...	Yellow and Black.
10.—Control and Pay Department...	Yellow and White.
11.—Ordnance ...	Blue and Red.
12.—Barrack ...	Drab (Khakee).
13.—Musketry ...	Blue and White.

The stripes of colour to be 6 inches broad worked across the puggree.

Adjutant General's Depatment 6 inches red and 3 inches white.

Quarter Master General's Department 6 inches white and 3 inches red.

Head Quarters Staff to be the same as above with gold cord and fringe, all others to be perfectly plain.

The puggree to be made of silk and to ensure uniformity 2 yards long and 1 foot broad.

Officers belonging to departments not mentioned in this list not to adopt any of the above colours.

S. N. S.

24th May, 1871.

III.

Conventional Rules for the Guidance of a Battalion at Field Practice.

THE following note has been kindly placed at our disposal by a "General," with this explanation: Last winter at————the—— Regiment were attempting Field manœuvres in a commendable spirit, but in a fashion wild, desultory and aimless. As I had Staveley's translation of the Prussian Instructions at hand I thought that by expunging a little German pedantry and irrelevant matter as well as condensing the whole in its present form with a slight adaptation of the subject to small bodies of troops, it might be of use to Commanding Officers in permanent quarters and exercising in an isolated manner.

It occurred to me, that, while retaining the ruling idea of the Prussians, the same tactical principles which obtained with larger bodies might also govern minor fractions if the unit were reduced in proportion, though raised in importance. The benefit of dealing with small bodies at first would be that all Officers, Non-Commissioned Officers, and even men would receive a sort of preparatory instruction to the Field manœuvring on a larger scale, which power would be thoroughly accustomed to act independently in securing a common end. Later, the same principles when applied to larger bodies and different ground, would be more easily interpreted; confidence, expediency and fertility of resources would be established. Any number of battalions thus previously trained would be pliable to a degree, when they came to be handled by the general officer, units would be better prepared to fit in the frame work of larger operations.

It is thus that my manuscript was begotten and printed. I had pen and ink illustrations delineating the various operations of the 'petite guerre' 'Bayonet charge.' 'Defence and attack of villages' 'Passes' 'Bridges,' etc., a l'allemand in miniature. The printer's skill had its limits and that portion was omitted, not being an 'homme de lettres' the paper may teem with inaccuracies of language and present a mere canvas capable of receiving any sort of correction, extension or illustration and embellishment. I have however clung to the spirit of the Prussian model which excludes precept and dogma as much as possible while leaving to Commanding Officers much latitude of execution.

RULES.

1. A general plan must regulate the manœuvres.

2. The general plan emanates from the Superintending (Commanding Officer) Officer who orders the manœuvres and is supposed to have a thorough knowledge of the country, from maps, personal observations, &c. He appoints the rendezvous of the parties to be opposed to each other.

3. Every incident of War in which a small body of troops, acting independently would participate, should be introduced.

4. The minutiæ of Adjutants Drill are not to be expected, but order and regularity must be observed as much as possible. The soldier must be taught the use of his intellect and all should clearly understand, beforehand from the leaders, the aim and principle of the operation to be executed.

5. A Battalion should not be parcelled out in small fractions separated at long distances from each other, and the supports ; unless it is supposed to cover the front of a Brigade, it should not be wholly extended in skirmishing order and supports. When acting independently the skirmishers and supports must be in proportion to the small column they are covering, and indeed each company, in this case, has its value and place in the column, which, relatively speaking, the Battalion unit has in the Brigade.

6. The Advanced or Rear Guard of such small forces should always resolve itself into skirmishers when necessary.

7. There are three ways of carrying out the Field Practice. I. By an imaginary enemy represented by 3 flags, one yard square each representing 1st Right Flank *Red*, 2nd Centre *Yellow*, 3rd Left Flank *Blue*. II. By an enemy composed partly of flags and troops. III. By an equal number of men of the same corps. One side being distinguished from the other by undress uniform or any other marked difference.

8. The two bodies are pitted against each other under separate commanders. To them the general idea of the operations only is communicated. Their largest tactical unit is the Company.

9. After the " General plan" has been communicated to the leaders the subsequent movements by them should in no way be influenced or prompted. The leaders are to be left to themselves. No rehearsals are to take place, and it is only after the issue of the affair or " move" that criticism is permitted to the superintending Officer. All should be left to the initiation and discretion of the leaders themselves. By this means they will gradually acquire a fertility of expedients, a coolnes and *coup d'œil* which will follow them in real warfare.

10. Every possible detail of Field duties in camp, &c., should be observed, parties told off at the bivouac for picquet, rations, water, fuel, &c. Every precaution of war should be taken in marching, and on any halt for however short a time of rest. It is not by a cloud of Videttes or Sentries that the principles of out-post duties should be observed. Leaders should study not to harass the men unnecessarily. One single Soldier judiciously placed, is worth a whole Company scattered in a senseless manner.

11. Two opposed bodies, may, when on the march be ignorant of the vicinity or approach of one to the other. It is only by a careful feeling of the way and obtaining information, that one can guard against a surprise. Of course this unexpected *rencontre* of the two bodies will force both rapidly to take up the best tactical formations, overcoming meanwhile all difficulties and obstacles of the ground.

12. The "General plan" may define the relative situations of hostile forces for successive days, during the same operations, or (in the case of inability to encamp or bivouac) for several hours in one day. But, as probably, the next hour or day of action may introduce new elements which had not been conceived in the "General plan" the new conditions compel the adoption of a "modified plan" for further proceedings. In case there should be no new conditions no "modified plan" is necessary, but any number of "moves" may necessitate a corresponding modification; while all such modifications, whether one or many are subordinate to the "General (intention) or plan."

13. As before stated, the bodies must have independent action as to the mode of execution, and the knowledge of their mutual situation or intentions should be kept secret from each other, while the legitimate mode of gaining information by patrols or small reconnaissance party, questioning the peasantry, &c., is open to them.

14. Both sides may march to engage, or, one side will attack and the other take up a carefully selected defensive position. The feature of the ground on both sides being thoroughly appreciated and utilised.

15. Any advantage by one leader should not be insisted upon which could not be brought about by a manifest superiority, say, of fire or manœuvre, or by clearly established fault or error of one of the two adversaries.

16. Undue haste is to be condemned as contrary to reality.

17. Pauses of different duration, according to the number of troops and their composition during an engagement, should separate the decisive incidents of a manœuvre. These are the different acts of the performance, and should be termed 1st and 2nd "moves," etc., etc.

18. Moral influences have no place in these exercises. They have doubtless a great share in the actual warfare. Here we must assume equality of courage, endurance, etc. No suppositious obstacles of ground, etc., are to be taken into account.

19. Flank turning movements should be resorted to with considerable caution. The adversary whose flank is turned, may be fully aware of it and have his reserve in hand with which the attacking party, not having calculated upon, may be caught in a trap of his own setting, and placed at serious disadvantage.

20. The Superintending Officer, alone, decides the issue and end

of a manœuvre. He can at any time order the " cease firing" and " halt" for the correction of mistakes, etc.

21. Whichever of the leaders, during a " move" thinks he has fulfilled his task, or has convinced himself that he cannot accomplish it, reports at once to the superintending Officer. The engagement is then broken off and the hostile parties occupy billets, encamp or bivouac, as the case may be, a short or long rest is allowed, piquets and sentries having been thrown out.

22. At the end of the day the Superintending Officer causes the Officers' call to be sounded to criticize or discuss the event. A mounted trumpeter or bugler should be always at his side.

23. The Superintending Officer may act himself as " umpire," or he may delegate one or two Officers not actively employed in the operations, to watch and decide in each separate case, unbiassed by the particular ideas of the leaders themselves.

The duty of the umpire is to decide

I.	Whether a force is to retire	... It retires.
II.	Whether cut off altogether	... Returns to quarters.
III.	Cut off temporarily	... Retires behind its lines, umpire decides further employment.
IV.	If captured	... Returns to quarters.

24. The decision of the umpire to be notified during the engagement to the leader concerned.

25. Firing inside a village, near tents, or any inflammable material not permitted. The defence of villages must take place on the outskirts, along fences, ditches, enclosures, etc.

Fractions occupying strong points " within" a village to be instructed how they should act in earnest, if ordered " not to fire."

26. The destruction of a bridge can only be simulated. Umpire will decide when it has been destroyed and repaired.

27. Cornfields, plantations and private property must be respected. Some crops should be considered as natural obstacles, and the decision early notified by the Superintending Officer.

28. Troops armed with Sniders or Enfield Rifles should not engage in volley or independent firing at a distance from the enemy of less than 250 paces, or with smooth bores at loss than 150 paces. Fire should not be opened by skirmishers with Sniders or Enfield at loss than 200 paces, or with Smooth Bores at less than 150 paces. A charge with the bayonet should not be made at more than 60 paces distance, and up to that distance it must be delivered with the greatest energy and with loud cheers, should opposed troops approach nearer than desirable the 'Halt' should be sounded and troops will order arms.

29. The leaders should not be merely content with attack and defence, but they should, at times, resort to stratagem and deceive each other by false demonstrations. They should affect intentions which they have no idea of carrying out, conceal their march, effect surprises, before a design can develop itself or be interpreted.

30. The leaders should make themselves acquainted with the depth of fords in their vicinity, or line of march, and be prepared to convey information for the march of Infantry, Cavalry or Artillery, and report whatever obstacles might impede it.

31. Communications should be jealously guarded.

32. Finally, the law must not be received from the enemy, but imposed on him, and it should be borne in mind that partial attacks from the circumference, on the clearsighted and prudent enemy, without preponderating motives or forces entails great risks.

N.B.—Every Officer should provide himself with a Field Telescope, and some correct sketch of the country. All Officers should make themselves acquainted with its general features while they advance, retreat, or fight, and be prepared to submit a sketch, however slight, of the day's proceedings to the Superintending Officers. One will be selected from each force after a manœuvre. Officers looking on should wear no sash. Umpires should have a white band on their sword arm.

A GENERAL OFFICER.

INVENTIONS.

A new pattern Portable Dooley by Sub-Conductor R. J. Dennett, Army Commissariat Department.

DESCRIPTION :

THE cot is an ordinary charpoy : the frame made of hard wood. When being packed for the march, the lacing at each end is undone and the end pieces slipped off.

The top consists of a bamboo pole 13½ feet long. Two rods of half-inch iron slightly curved with pivots at the centre of each to fix into the bamboo. Two strips of light wood with iron sockets at the ends of each to fit on the rod, and secured by small iron hooks which fit into holes at the ends of the rods. A rope from each leg of the cot tied to the ends of the rods keeps the top from falling to either side.

The end supports consist of two iron rods fastened by iron bolts to each leg, and to the pole by a screw-bolt and nut forming a sort of triangle which is kept upright and steady by other iron rods going from the sides of the cot and hooking into catches.

Clips with small chains are fastened to each leg, which fit into holes made in the bolts, thus preventing the rods from slipping off.

A purdah of red dosooty lined with white cloth forms the outside covering.

When the Dandy is to be packed for the march, the rods, bolts, pole, etc., are separated and placed lengthways in the centre of the charpoy, which is then folded up and tied firmly with the end ropes ; the whole is then packed in a suleetah.

The advantages claimed for this dooley are as follows :

1*st.* The great advantage of doing away with expense of building and of keeping in repair large temporary Dooley Godowns (for instance, a Verandah is in course of construction in my Godown for Doolies at a cost of Rs. 2,500 or thereabouts.

2*nd.* Being portable their despatch from station to station is facilitated.

3*rd.* A regiment is enabled, when marching, to take its Dooleys with it by rail, an advantage of much importance if it had to leave the rail at a point where the means of procuring other Dooleys would be difficult, as would invariably be the case on active service.

4*th.* The necessity of Kahars receiving full in lieu of half hire when returning with the Dooleys is obviated, thereby saving Rs. 201 per mensem for every 15 Dooleys, as follows, which might be returned on camels, at

5 Dooleys per camel. A Regiment taking its Dooleys with it (see para. 3) the necessity of their being returned would seldom arise, as they could be taken to pieces and housed like other camp equipage.

The Saving in every 15 Dooleys would be as follows:

15 Dooleys—90 men at Rs. 2-8 each	...	Rs.	225
Deduct hire of three Camels at Rs. 8 each	...	„	24
Total thus saved	...	Rs.	201

5th. They are better adapted for use in Cholera Camps (especially in the rains) when carriage is difficult to procure, and thus the inconvenience of sleeping on the damp ground until cots could be sent from barracks, or native cots provided by the Commissariat which would entail a great expense on the outbreak of an epidemic, is obviated.

I may add that native cots are authorized for such purposes, per C.G.C., No. 96, dated 16-8-70.

6th. The ends being moveable the advantages of a regularly made bed-cot (which is a great boon to the sick in tents) are apparent.

7th. The great advantage of being constructed for Europeans to carry, with or without a roof, the former to protect the patient from the inclemency of the weather, and the latter when required as a stretcher for removing the dead and wounded from the field. It being universally understood that the old pattern Dooley with the pole cannot possibly be carried by Europeans, should the Kahars abscond from the field.

8th. As a Regiment on an ordinary march is allowed Dooleys five, and on active service ten per cent. of strength (*vide* C.G.C., No. 90, dated 8-11-67) they could be carried on ten or twenty camels, as the case may be, and Kahars only entertained as required, they being invariably procurable in every village in India, thus a saving of Rs. 142 for every five Dooleys not occupied is effected, it being believed that on ordinary occasions scarcely half the number allowed are required for use although the full establishment has to be kept up for the conveyance of the old Dooleys, there being no other means for carrying them. Any number of the pattern submitted, being portable, may be transported by camels, carts, or any other conveyance.

9th. Simplicity of construction is at once shown. They can be made by any native mistry in a very short time.

R. J. DENNETT,

Sub-Conductor,

Army Commissariat Department.

CORRESPONDENCE.

I.

To

THE EDITOR OF

THE UNITED SERVICE INSTITUTION OF INDIA.

SIR,

I would take advantage of the pages of the Journal of the United Service Institution of India to re-open a question I unsuccessfully brought to notice some years since, *viz.* of the great advisability there is for the establishment of a Veterinary School, or Schools, in India.

Such a School exists in Bombay, and has, I believe, proved a great success.

The Commandants of the Native Cavalry Regiments will, I am sure, bear me out in saying there is at present not only the greatest difficulty, but almost an impossibility, in obtaining any qualified men to fill the situations of Salootries and Farriers, a want which I doubt not is equally felt in Native Batteries.

The treatment of disease in the human subject and in the horse are so similar, that perhaps in the first instance, Veterinary classes could be advantageously arranged for at the Medical Colleges, where the preliminary education in regard to anatomy and the properties and uses of medicines might be obtained, a practical course being afterwards gone through under a Veterinary Surgeon : and who might lecture periodically to the classes at the College. The expenses should not be great, and would probably be covered or nearly so by the fees which would be required from the students, and which in the case of soldiers or farriers in the Native Cavalry would be met regimentally.

I do not think the classes should be confined only to the army, but a new field of education might be opened thereby to the natives of the country, and a great want supplied in all districts and large towns, mitigating in some measure the present barbarous treatment of sick animals etc., as now carried on throughout the country, and a trained body of native Veterenarians would be secured, whose services would be invaluable for employment with the cattle of a Land Transport Corps of an Army acting within or beyond our border.

W. PAGET, *Major,*

Commandant 5th Punjab Cavalry.

II.

SIR,

I think the following extract of a letter from the late Sir Henry Durand (among the last he ever wrote) may be of interest to the readers of the Journal of the United Service Institution of India, and not without some importance to the Government in regard to the question of adequately arming our Native Army.

The letter in question is dated Kohat 17th December 1870, and says, "one thing I must note, to-day I saw a rifle factory on the Arm-"strong coil principle that would surprise our gunsmiths in London, all "so simple yet the manipulation so dexterous, and the weapon apparent-"ly so strong and serviceable. I was surprised, mean to have one tested, "and expect to find a strong reason for better arms to our Native troops. "These factories turn out about 400 rifles a year, and all go to the tribes "around. The curious thing is 80 years ago this art or manufacture "was introduced from Persia. Here it has remained. A long descrip-"tion would be interesting but I have not time to say more than that I "have been thoroughly surprised."

Perhaps, some of our members at Kohat may be induced to follow up the hint given in the concluding paragraph, and give us an account of this factory.

I am, Gentlemen,

Your obedient Servant,

C. M. MACGREGOR, LIEUT.-COL.,

Bengal Staff Corps.

III.

SIR,

Lieutenant Colonel Macgregor's letter in the last number of the Journal contains the wish of a great number of officers of the Indian Army as regards admission to the Staff College, Sandhurst, but there are one or two points which, I think, require attention.

1*st.* Lieutenant Colonel Macgregor suggests English pay whilst at Sandhurst, as this would be less than the minimum rate of furlough pay, *i. e.*, £250 per annum; I would suggest that in any proposal to Government for this purpose, furlough pay and not the English rate be recommended. The reasons which induced an increase in the furlough rates of pay apply equally to officers at Sandhurst.

2*nd.* The time passed at Sandhurst should be allowed to count as service in India.

3*rd*. As no expenditure now-a-days is incurred unless duly provided for in the annual budget, and as it is highly desirable that some few officers should begin their studies at the College as soon as possible. I beg leave, therefore, to offer the following suggestion, by which, some 20 or 25 officers might go home this year. It is, offer to officers willing to proceed home at their own expense, permission to do so, obtaining for them in this exceptional case admission to the Staff College without passing the preliminary entrance examination, but requiring them, from date of permission to proceed to England being granted, and until they reach Sandhurst, to read up and study the obligatory subjects required for the entrance examination. The obligatory subjects are, I believe, Arithmetic, the first four books of Euclid, Algebra as far as Quadratics, Elementary Field Fortification, and either French, German, or Hindostance. If the Officers granted leave to go, be allowed to leave India in October, by the first February next year, the date the College course commences, they would be quite up to the standard for admission required in the obligatory, if not in other subjects as well. In return, I do not think it is too much to ask, 1st, that the time passed at Sandhurst be allowed as service in India, and 2ndly, Indian pay and allowances of rank without Staff pay. I do not think the Government will be put to any expense by the above suggestion, as it would still have had to give the same rate of pay to these Officers who would, otherwise, be in India with their Regiments. I, for one, would be glad to accept the offer suggested above, having for many years been anxious to obtain an opportunity of admission to the Staff College.

I beg to remain,

Yours obediently,

J. P. FITZGERALD COLOGAN, *Captain*,

Bengal Staff Corps.

ORIGINAL PAPERS.

I.

Remarks on the proportion of Artillery required for the Army in India.

The proportion of Artillery we require in this country has doubtless been well considered in higher quarters, but it is a subject of such importance, that a few facts regarding it may not be superfluous. Men's minds have of late, especially in England, been much taken up with the question of our national defences; but it cannot fail to be remarked, that while public opinion is split up into parties upon it, military men as a rule differ widely from civilians, in the views they take. While it must be allowed that anything like a national panic is injurious and exposes us to the ridicule of our neighbours, it cannot, I think, be denied, that the British Nation have required something startling or even sensational, to induce them to look into the *cons*, as well as the *pros* of the matter.

Military men who have been prominent in the discussions which have lately taken place, do not advocate measures of advancement for themselves or their brethren in arms; the preservation of the national honour and of England's Military glory, is their object; and, therefore, I think there is an unfair reflection upon certain military writers in such paragraphs as the following, which I copy from the "Times:"

"What would have been the case if France instead of Prussia had been triumphant in the strife? If we are to expect an invasion from Germany, why not from Italy or Spain? Will there ever be a relief for us, if one bugbear is thus to be set up after another, and if every effort of our own is to be dismissed as contemptible as soon as it is made? What are we to do for the final satisfaction of alarmist projectors, and, it must be added professional advisers?"

Military men, not as a rule given to start at shadows raised by themselves, can see danger when the temper of England is directed by men capable of penning such sentences.

As an instance of the widely prevailing ideas which these "professional advisers" have striven hard to counteract, we may refer to the view taken by the *Spectator* in reviewing the "Battle of Dorking," when it remarked that the writer had taken no account of the Army that, on the first sound of danger, would spring up in the south of England. It is this idea of an Army "springing up" at once into existence and efficiency, which the British mind will not part with: who the magician is, and where lies the wand we do not learn. And yet there are happily plenty enough of officers in our Army, ready and willing to face difficulties as well as dangers to almost any extent.

But this paper refers to Artillery matters, not to generalities, to facts, not theories, and to India as a part of the British Empire. The facts I would wish to draw attention to, are the relative proportions of Artillery to the rest of the Army which existed before the Mutiny, and which we now have; adducing as practical examples of our requirements, the employment and distribution of the Artillery force in the Bengal Presidency, on the occasions of the first and second Sikh wars. These are quoted as average types of a war in India, but were we to try conclusions with any foreign power on its shores, or to face another general combination within its limits, the deductions would fall short of the truth.

It is generally supposed that 3 pieces of Artillery per 1000 men is the proper proportion for an Army, but neither here nor at home have we got it. Continental authorities have laid down a smaller ratio, about 2·5; but in calculating strength, all ranks are given: we usually only mention rank and file in our computations. Whatever the proportion is, it must be calculated for the whole Army; for every corps which may be engaged in the field. or retained for the defence of a cantonment or fort. It would be false reasoning to calculate merely for the regular portion of an Army, and omit the reserves and the irregular forces and regiments, which though primarily intended for local purposes, may yet be employed against an enemy: on the contrary, the less disciplined a body of men may be, the more it stands in need of Artillery support. This reasioning would be false too, because local status goes for little in the argument.

We start with the supposition that Artillery is kept up to an average war footing. In calculating ordnance, too, for the field, the mortar, or heavy batteries of position are left out, as well as all mountain batteries, which are intended for particular service not for general use. On the other hand the Corps of Guides, Governor General's Body Guard, &c., which have special duties of their own, are also omitted.

Table No. 1 gives a comparative statement of the strength of the Bengal Army, with the Contingents of Central India as they appear in the Army Lists, in the early part of 1857 and 1871, the averages of strength are only roughly given. They used to vary considerably, Native Regiments of the line had 1,000 men, others less; at present the rank and file amount to 408 for British Cavalry, 384 for Native Cavalry of the line, and 420 for Punjab Cavalry, in round numbers 400; British Infantry 820, Native ditto 640; none are upon a war footing. It will be seen that the total strength of the Army is now not more than one half what it then was; on the other hand, the Army has gained by the erasure from its lists of the numerous local half Military Corps, which had grown from the earliest times, like fungus excrescences, on the regular establishment. According to these figures too, we see that the proportion of guns now is about one-third greater than it used to be, while the number is nearly one-third less; of the twenty-one Field Batteries in 1857, however, 5 were drawn by bullocks, and the "Post Guns,"

a relic of the system which began to disappear in 1818, were supplied, when necessary, with draught cattle from the Commissariat. Neither could be placed in comparison as to efficiency with the ordnance of Horse Field Batteries.

If, however, we calculate the regiments we have now, at a more fitting war average of 500 sabres and 1,000 bayonets (which would include depot reserves), we should have 17,750 Cavalry, and 103,000 Infantry, which would place our force of 232 pieces of ordnance in the proportion of 1·9 per 1,000 only: we should require 300, or no less than 68 more than our present complement, to bring up the proportion to 2·5 per 1,000 for Bengal alone.

It is necessary, however, to consider the whole Army of India with reference to this question. Table No. 2 gives the whole of the regiments in the three Presidencies and in Central India, and here we are met by the question:—Is it necessary to calculate for the whole Army of India on a war footing? Perhaps not. But the present reduced establishments would be too unsafe a basis. If we therefore take the average at 480 sabres, and 800 bayonets for each regiment, we have a total of 175,760 men, with a proportion only of 2·2 guns per 1,000. To bring the latter up to 2·5, an addition of 51 pieces of ordnance would be required.

Now let us take the case of two wars of average magnitude in India, and see what force of Artillery was required on service and what was left in garrison.

In the first Sikh War, 1845-46, there were of the Bengal Artillery—

	Horse Artillery Batteries.	Field Batteries.
With the Army in the field	11	5
In Sind	0	2
In Cantonments at Loodiana and Muttra	2	0
Ditto ditto at Meerut, Neemuch, Nusseerabad, Mhow, Nowgong, Agra, Bareilly, Lucknow, Cawnpore, Benares, Dinapore, and Dumdum	0	12
Total	13	19

In the second Sikh War, 1848-49, there were—

	Horse Artillery Batteries.	Field Batteries.
In the field, including Army of Reserve and Lahore Garrison	Bengal Artillery 11	8
	Bombay do. 1	2
In Cantonments (Bengal Artillery) at Loodiana & Muttra	2	0
Ditto ditto ditto Neemuch, Nusseerabad, Nowgong, Delhi, Agra, Bareilly, Lucknow, Benares, Dinapore, Mhow, and Dumdum	0	11
Total	14	21

If any one will take the trouble to look out the stations mentioned here, upon a map, he will be able to judge how far the reserves were available for any contingency during these wars (and both had their ugly chances at one time,) even, setting aside the badness of country roads and the difficulty there would have been in procuring carriage. I was with three reserve companies which left Dumdum for the Punjab in November 1848, and the only Artillery men we met with from Cawnpore, (where was stationed only a reserve company,) right up to the Sutlej, were Colonel Farrington, and Lieutenant G. K. Money, the Commanding Officer and Adjutant of the 7th Battalion at Meerut. We were halted for a couple of days at Allahabad, in December, because the festivals of the Dewali and Muharram falling together, the Muhammadans, as their wont is, took advantage of the absence of troops* to prove the sons of Ali better men than the gods of the Hindus; and here we may remark, that the proceedings of the Wahabis, and the recent events in Rohilkhund, are only a portion of the proof we constantly receive, that the fanatical spirit of the Musalman has not yet been "laid," but is as ready as ever to spring into life.

If, therefore, the 32 Horse and Field Batteries which we had at the period in Bengal, in addition to a number of Artillery details attached to Irregular Corps, and Post Guns, were not sufficient for the internal defence of the country in 1845-49, we can hardly consider our present strength of 33 to be so with the Punjab and Oude added to our territory, even taking increased facilities of communication into account.

The great disproportion between the Horse and Foot Artillery employed in the Sikh wars will have been noticed. It is readily explained by the number of Field Batteries which had bullock draught. In the end of 1845, two were drawn by camels, seven by horses and ten by bullocks; economy refused to attend to the remonstrances of "professional advisers," reiterated during a previous period of nearly thirty years, and perpetuated a system which made a large number of batteries useless for *active* service, and in the face of modern improvements, ridiculous on parade.

Here again the question suggests itself—is the proportion of Horse Artillery too great? We have as will be seen by a glance at Table No. 2, a large proportion of the more expensive branch than the Cavalry bear to the Infantry. It has been the expressed opinion of more than one officer of experience that we could dispense with Horse Artillery altogether in India. I do not know whether any Artillery Officers have endorsed this view. I think not. I rather think that the opinion of a large majority of the best judges of all branches would be for retaining it. We have indeed many instances of its value. It is not necessary to

*That the paucity of troops in these Provinces was not unobserved, we have a proof also in the intercepted letter written from her place of confinement at Benares to Sirdars Chattar Singh and Mulraj, by the imprisoned Maharani Jhanda Kaur in February 1849: she said "the British have no troops in this part of the country, certainly not more than 1,000 or 2,000 men, and at night are accustomed to sleep with no one near them." But when are we not watched?

go back to Lord Lake's time and refer to the well known and astonishing marches performed by Cavalry and Horse Artillery, for proof. The pursuit of the Sikhs and Afghans under Sir Walter Gilbert in 1849, and the pursuit of Tantia Topee in 1858, are later instances of the absolute necessity of ordnance of the most moveable kind. Native armies in India have always consisted of a very large proportion of Cavalry, and the injury which might be done, and perhaps temporary success achieved by them, which might be matured by neglect into disaster, will always compel us to keep weapons in hand which can efficiently meet such emergencies. I doubt much if any officer, with guns of the heavier calibre, would have attempted the feat accomplished by the 4th Troop, 3rd Brigade, when Lieutenant Murray Mackenzie took it across the Unai and Irak passes, to Bamian in Afghanistan, in September—October 1839, after the route had been officially pronounced impracticable.

It might be possible to do with only ten or twelve Batteries of Horse Artillery, but that our total number of field pieces is considerably under the mark, the foregoing facts I think plainly show.

With regard to the Garrison Batteries, these facts do not supply such clear data. It would not appear that we need so much an increase of numbers in men as an alteration in their disposition, and this I will endeavour briefly to shew. With its surf-bound sea-line, India requires very few coast defences: we have points which must be occupied it is true, but the nature of our tenure of the country requires that we should never fight behind walls though we may have to fight against them. It is therefore only for sieges that Garrison Artillery are wanted: on such occasions the call is for larger bodies of men than we generally have available. The records of all our sieges, except perhaps that of Hatras in 1817, show that not only Horse Artillerymen but also Cavalry and Infantry, were called upon to perform duties in the Batteries. Wherever Garrison Artillery are employed on service they are required in much larger bodies than any one of our Batteries on their present strength could furnish, even for the smallest undertakings. I know of no instance to the contrary. The establishment allowed for India is much smaller than at home, and I do not think any reason can be given for the difference; economy, probably, was the object, but it is not attained as I hope to show.

The old establishment of reserve companies was considered insufficient, and H. R. H. the Duke of Cambridge endorsed this opinion in speaking of the Artillery in general in India.* The special Committee of Artillery Officers assembled at Meerut in the end of 1859, recommended 130 Non-Commissioned Officers and Men for Garrison Batteries, the Government of India approved of 75.

That the then Secretary of State for India doubted the advantage of such a reduction may be inferred from his own words in confirming the Government proposition. He says:—

* Quoted in G. G. O. No. 205, dated.

"13; experience alone can show, however, whether with the number of reserve Batteries now proposed, the organization will suffice to render the Batteries themselves efficient in garrison and siege operations, and be equal at the same time to furnish reinforcements on occasional emergencies to the Light Field Batteries. They must be looked upon as available for both these purposes."

While most, if not all, Artillery Officers will dissent from the proposition that Garrison Artillery should be considered a reserve for the other branches,* few, perhaps, will not agree in the opinion that the Batteries are too small for efficiency, that there is no immediate necessity for increasing the number of men.

Fewer Garrison Batteries then of an increased strength is the conclusion, and I would submit that given in Table No. 3 (which also shows the present one) as an appropriate establishment.

The chief reasons for increasing the Batteries as proposed are—

I.—That the proportion of Gunners to Non-Commissioned Officers will give a better class of men for promotion: on nothing so much as the Non-Commissioned grade does the steadiness and good conduct of the Battery depend; it is almost superfluous to say so, but all the exertions of good Officers may be neutralised by a bad set of them. Do our Batteries get a fair chance in a matter of such paramount importance? In an Infantry regiment there are 780 privates from whom to select 40 Sergeants and 40 Corporals, Company Non-Commissioned Officers. A proportion of 9·6 privates to each Non-Commissioned Officer. In Horse and Field Batteries there are 118 Gunners and Drivers for the 20 Non-Commissioned Officers; a proportion of 5·9 Gunners or Drivers to each Non-Commissioned Officer; and when we come to Garrison Batteries, there are 60 of the former to 13 of the latter, a proportion of 4·6 to 1.† That is, among every four Gunners in the latter case (for Batteries never being up to full strength the disproportion is even greater) we are expected to find one man not only of steady character but of superior education, which is rare, and capable of detecting and repressing irregularities in others, with judgment and firmness, rarer still. What wonder therefere, if we find men repeatedly promoted again after reduction?

II.—The provision of the means of instruction for Garrison Batteries is attended with considerable expense, and their extent depends on circumstances; at stations where there are Arsenals, (where Garrison Batteries as a rule should be stationed,) the means will be greater and nearer at hand to reduce the number; besides being in this respect an economical measure, would improve the means of instruction for the remainder.

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* It is easy to imagine an emergency arising in war time, rendering indents upon the Garrison Artillery for men a necessity, still the principle advocated holds good.

† Regimental and Brigade Staff Non-Commissioned Officers are left out; to include them, as strictly speaking should be done, would make the comparison more unfavorable.

III.—The increased respectability attaching to the command of a large body of men would be more commensurate with its real importance. We ought not to lose sight of such considerations. The men themselves would feel it as much as any one, and an improved tone would result.

IV.—In the event of any extension of our force of Garrison Artillery, it would be easier to make one such Battery as that proposed the nucleus of two, than to form an additional one by drafts of experienced Gunners from different Batteries, as would now have to be done. Every one may not agree with me in this, but it appears to me to be plain.

I have not referred to Garrison Batteries, supplied with heavy ordnance, as Batteries of position, because I think they should be classed among the Field Artillery, but as long as they are manned as at present there is urgent need for a larger number of men with them. The number of Non-Commissioned Officers, four of each grade, is not adapted for the six subdivisions, and to give only the number of men requisite for serving the ordnance, and two men besides per subdivision, for each of the three rear lines of carriages, makes 76 Non-Commissioned Officers and men present on parade. If to these we add guards, orderlies and sick, 100 men of all ranks will not appear too large a number. At present a Heavy Battery is not fit for service as it stands.

Omitting then Heavy and Mountain Batteries, we might have in Bengal eight Garrison ones instead of fourteen, located as follows :—

1. Fort William.
2. Allahabad.
3. Cawnpore.
4. Gwalior.
5. Agra.
6. Ferozepore.
7. Mean Meer.
8. Attock, to go to Rawul Pindee when the Arsenal there is completed.

In Madras, instead of seven, we might have three stationed at—

1. Fort St. George.
2. Rangoon.
3. Bellary.

And in Bombay, where now there are five, there might be three ; viz. at

1. Aden.
2. Poonah.
3. Belgaum.

We should thus have 14 Batteries of 120 Gunners, instead of 26 with only 60; an increase on the whole ef 120 Gunners. The comparative cost would be as follows:—

26	Batteries at	Rs.	3,417	3	11	per month,	...	Rs.	88,868	5 10
14	do.	„	4,979	11	0	do.	...	„	69,715	11 0
							Total saving per month,	Rs.	19,132	11 10

These remarks have extended mnch beyond the limits I had allowed myself, so I will add nothing further than to say that they have been carefully thought over before being committed to paper.

J. W. STUBBS,
Captain and Brevet Major, R. A.

Table No. 1.

Comparative strength of the Army in Bengal and Central India at the commencement of the year 1857 and 1871.

	1857.			1871.		
	Cavalry.	Infantry.	Guns or Howitzers.	Cavalry.	Infantry.	Guns or Howitzers.
Batteries of Horse Artillery	...	...	78	...	...	66
Field Batteries	...	...	126	...	...	132
Heavy Field Batteries	...	...	..	...	...	6
Post Guns	...	..	..	...	...	...
Her Majesty's Regiments	2	14	...	5	32	...
E. I. Co.'s European Regiments	...	3	...	...	...	...
Native Regiments of the line	10	74	...	19	45	...
Irregular Cavalry of the line	18	...	...	...	...	...
Goorkha Regiments	...	3	...	...	4	...
Sikh Infantry Regiments	...	4	...			
Punjab Irregular Non-Frontier Force ..	5	6	18	5	11	12
Oude Irregular Force	3	10	18	...	...	...
Local and Irregular Corps. Calcutta Native Militia	...	1*	...	...	...	...
Assam Light Infantry	...	2*	...	...	...	...
Sylhet ditto	...	1*	2	...	...	...
Arracan Battalion	...	1	...	...	...	...
Pegu Light Infantry	...	...†	...	...	...	...
Ramghur Light Infantry	...	1	4	...	...	...
Bhagulpore Hill Rangers	...	1	...	...	...	...
Shekawattee Battalion	...	1*	...	...	...	...
Kelat-e-Ghilze Regiment	..	1*	...	...	...	...
Ferozepore ditto	...	1*	...	...	...	...
Loodiana ditto	...	1*	...	...	...	...
Mhairwara Battalion	...	1	...	...	...	...
Bheel Corps	...	2	2	...	2	...
Nimar Police Battalion	...	... ‡	...	...	...	...
Hyderabad Contingent	4	6	24	4	6	16
Gwalior Contingent	2	7	24	...	...	...
Nagpore Irregular Force	1	3	6	...	...	...
Bhopal Contingent	½	1	...	...	..	...
Kota Contingent	½	1	...	...	...	...
Jodhpore Legion, now Erinpoorah I. F. ...	½	1	4	¼	1	...
Malwah Contingent	1	1	8	...	...	...
Deoli Irregular Force	...	...	...	¼	1	...
Bhopal Battalion	...	...	...	...	1	...
Central India Horse	...	...	...	2	...	...
Total number of Regiments and Guns ...	47½	148	328	35½	103	232
Average strength of Regiments	500	950		400	700	
Total number of men	23,750	140,600		14,200	72,100	
Grand Total	164,350			86,300		
Average number of Guns per 1,000 ...	1·99			2·68		

* These Corps sre still in existence as Line Regiments.
† Now belongs to Madras ; omitted therefore from both columns.
‡ Omitted as only a Police Corps.

Table No. 2.

Strength of the Army in India at the commencement of the year 1871.

		Cavalry.	Infantry.	Guns and Howitzers.
Bengal.	11 Batteries of Horse Artillery, ...	...	..	66
	22 Field Batteries, ...	...	...	132
	2 Heavy Field Batteries, ...	...	...	6
	British Regiments of the line, ...	5	32	...
	Native Regiments of the line, ...	19	45	...
	Goorkha Regiments, ...	...	4	...
	Punjab Frontier Force, ...	5	11	12
Central India.	Central India Horse, ...	2	...	...
	Deoli Irregular Force, ...	¼	1	...
	Erinpoorah Irregular Force, ...	¼	1	...
	Bheel Corps, ...	...	2	...
	Bhopal Battalion, ...	...	1	...
	Hydrabad Contingent, ...	4	6	16
Madras.	2 Batteries of Horse Artillery, ...	...	...	12
	10 Field Batteries, ...	...	...	66
	1 Heavy Field Battery, ...	...	...	3
	British Regiments of the line, ...	2	9	...
	Native Regiments of the line, ...	4	41	...
Bombay.	2 Batteries of Horse Artillery, ...	...	...	12
	10 Field Batteries, ...	...	...	60
	1 Heavy Field Battery, ...	...	...	3
	British Regiments of the line, ...	1	7	...
	Native Regiments of the line, ...	3	30	...
	Poonah Horse, ...	1	...	...
	Sind Horse, ...	3	...	...
Total number of Regiments and Guns, ...		49½	190	388
Average strength of Regiments		480	800	
Total number of men, ...		23,760	152,000	
Grand total, ...		175,760		
Average number of Guns per 1,000, ...		2·2		

Table No. 3.

Showing the comparative cost of a Garrison Battery of Royal Artillery as at present constituted and as proposed.

		As at present.				As Proposed.				
		Number.	Total Pay for a month of 30 days. Rs.	A.	P.	Number.	Total Pay for a month of 30 days. Rs.	A.	P.	
Officers.	Captain, ...	1	433	10	0	1	433	10	0	
	2nd Captain, ...	1	417	7	8	1	417	7	8	
	Lieuts., increased pay	2	531	8	0	3	797	4	0	
	,, lower rate, ...	1	213	5	0	1	213	5	0	
N. C. O. and Men.	Sergeant Major, ...	1	52	15	4	1	52	15	4	
	Qr. Mr. Sergeant, ...	...	0	0	0	1	52	15	4	
	Sergeants, ...	4	156	11	8	6	235	1	6	
	Corporals, ...	4	117	8	8	4	117	8	8	
	Bombardiers, ...	4	107	12	0	4	107	12	0	
	Trumpeter (Bomr.)..	1	26	15	0	1	26	15	0	
	,, Gunners,	1	16	3	7	2	32	7	2	
	Gunners, ...	60	973	7	0	120	1,946	14	0	
	Command allowance,...	...	60	12	0	...	120	0	0	
	Mess allowance, ...	...	40	0	0	...	50	0	0	
	Pay Sergeant, ...	...	10	0	0	1	52	15	2	Effective Non-Combatant.
Native Establishment.	Tindal, ...	1	7	8	0	1	7	8	0	
	Store Lascars, ...	6	36	0	0	8	48	0	0	
	Tent ,, ...	2	11	8	0	0	0	0	0	
Servants.	Puckallees, ...	2	18	0	0	3	27	0	0	
	Sweepers, ...	2	8	0	0	3	12	0	0	
Conservancy.	Bheestee,...	1	5	0	0	2	10	0	0	
	Sweepers, ...	3	12	0	0	4	16	0	0	
Hospital Establishment.	Asst. Apothecary, ...	1	100	0	0	1	100	0	0	
	Hospital Apprentice,	...	0	0	0	...	0	0	0	only on service
	Compounder, ...	1	10	0	0	1	10	0	0	
	Dresser, ...	...	0	0	0	1	8	0	0	
	Steward's Servant & shop coolie,...	1	6	0	0	1	6	0	0	
	Bheestees, ...	1	5	0	0	2	10	0	0	
	Sweeper, ...	1	5	0	0	2	9	0	0	
	Cooks, ...	1	5	0	0	2	10	0	0	
	Sirdar Coolie, ...	...	0	0	0	1	6	0	0	
	Coolies, ...	2	8	0	0	4	16	0	0	
	Mate Bearer, ...	1	5	0	0	1	5	0	0	
	Bearers, ...	3	12	0	0	3	12	0	0	
	Washer-men, ...	1	5	0	0	2	10	0	0	
	Total Pay per month, ...		3,417	3	11	...	4,979	11	0	

II.

Remarks on the Organisation of Native Infantry.

THE present organisation of a Battalion of Native, Infantry of the Bengal Army is as follows:—

1	Commandant.
1	2nd in Command } Commanding Wings.
1	Wing Officer }
2	Wing Subalterns.
1	Adjutant.
1	Quarter Master.
1	Surgeon.
Total, 8	European Officers.
8	Subadars.
8	Jemadars.
40	Havildars.
40	Naicks.
Total, 96	Native Commissioned and Non-Commissioned Officers.
8	Companies of 75 men each.
Total, 600	Sepoys.

There are I think great objections to this organisation.

1*st.*—The unnecessary subdivision of the Battalion into so many companies.

2*nd.*—The superfluity of Officers, disproportion of the ranks, and consequent number of idlers.

With regard to the first, I believe it is admitted that the Native of India does not, as a rule, make a good superior Officer. However efficient in the simple strict routine duties of a Non-Commissioned Officer he may have been, he is no sooner called upon for the display of firmness and integrity, than he fails, and this, in the present system of promotion by seniority, is only discovered when too late, when a bad or ndifferent Native Officer has been established in the Regiment.

But there are also in every Regiment a few bright exceptions to this rule, men of character and energy.

It is, therefore, I think desirable that the men of a Native Regiment should be collected in as large numbers as practicable, under the supervision of a *few* able and influential Officers, instead of being as at present, in small companies subjected to the bad example and injurious action of twice or three times the number of bad or indifferent ones.

A Battalion of 600 Natives should not be divlded into more than four companies, two in each wing.

The supervision would be then concentrated and increased, the

details of duty simplified and more readily carried out, and there would be a saving of expense to Government. In field movements also, by the new system of drill, a Battalion of a few strong companies works far more readily and with much less noise, than one frittered away in small divisions, each shouted at with a corresponding number of cautions and words of command.

With regard to the 2nd objection: if 4 companies are a sufficient division of a Battalion it is clear that half of the present number of Native Officers is superfluous, but I would go further and say two-thirds of the Native Commissioned Officers are mere puppets, and are really of no use in the Regiment, whether from, (as before stated) want of character, or being Jemadars from their position.

Jemadars do nothing, and for the most part are content with saving as much money as they can between the hour of their promotion and the day on which they can obtain a good pension.

They are, therefore, mere idlers in a Regiment.

Wing Subalterns, at present, having no duties assigned to them in the Regiment, are idlers as far as it is concerned.

The duty states of any Corps show that Havildars are much more lightly worked than the Naicks who have more duty to perform than any other rank.

In a new organisation, therefore, the number of the former might be reduced, but the latter should be kept at their present strength, supplemented by half the number of paid Lance Naicks.

I will now propose a reorganisation of the Native Infantry which I think would be superior to the present in that—

1*st.*—European Officers at present unemployed would have regular duties to perform.

2*nd.*—There would be no idlers.

3*rd.*—The ranks of Officers would be in proportion to the duties.

4*th.*—There would be a saving of expense to Government.

PROPOSED ORGANISATION.

1 Commandant as at present.

1st Battalion Officer,—2nd in Command and Wing Officer as at present.

2nd Battalion Officer,—Wing Officer Commanding left wing as at present.

3rd Battalion Officer,—to command 1 Company of 150 men with an allowance of Rs. 100 per mensem as now drawn by Wing Subalterns.

4th Battalion Officer,—To Command 1 Company of 150 men with an allowance of Rs. 100 per mensem as now drawn by Wing Subalterns.
5th Battalion Officer,—Ditto ditto ditto.
6th Battalion Officer,—Ditto ditto ditto.
1 Adjutant.—As at present.
1 Quarter Master.—As at present.
1 Surgeon.—As at present.
Total 10 European Officers.
4 Subadars as at present 1st and 2nd Class.
4 Color Havildars to be carefully selected and well educated men, keeping the accounts and working the details of the Company, at Rs. 30 each.
20 Havildars at Rs. 20 each.
40 Naicks at Rs, 15 each.
20 Lance Naicks, Sepoys on probation for promotion with an increase of Rs. 2 on Sepoy's pay.
600 Sepoys as at present.

I should say that in this organisation, promotions should be more by selection than by seniority.

The Lance Naicks and Color Havildars especially should be carefully chosen.

The Native Commissioned Officers, being few in number and taken from the Color Havildars, would be men accustomed to work, able to read and write, in fact men of energy and ability and would be respected by, and would have influence with, their European Officers, who, in their turn, no longer listless and unemployed, would take an interest in their Companies; and by their firmness of character, intelligence and knowledge of musketry (in which, by the way, each one should have a certificate from the Instructor of a European Regiment,) would be of great benefit to the Regiment.

In the above system I would recommend that the colors should be abolished, or at least reduced to one. In the Umbeyla campaign no Regiment had its colors, and the want was never felt.

Finally, I would recommend in connection with this plan of reorganisation, that the term for which the men are at first engaged should be extended to four or even five years, and that the first good conduct rupee should be given at the completion of the first term of service, when every man should be again enlisted for not more than three years, and so on, getting an extra rupee each term.

That the invalid Pension Rules should be altered, the first being as at present, the second compulsory after a fixed term of service, say 26 years.

I will only add that if the composition of each of these four companies were carefully attended to, for instance, one being of Sikhs, one

of Pathans, one of Dogres, one of Hindustanis from Oudh, and all carefully recruited, I should imagine the army very compact and useful. Government would have the power of increasing or reducing troops, of certain nationalities, in most districts at a day or two day's notice, to any extent into well organised Companies, that could be arranged into Battalions as circumstances might require on the spot, without the least delay or trouble.

Since writing the above it has struck me that should the abolition of the rank of Jamadar be considered too violent a change, the working man of the Company might be called Jamadar instead of Color Havildar.

C. C. G. ROSS, *Colonel,*

14th Native Infantry.

PRESENT ORGANISATION.					PROPOSED ORGANISATION.				
Number.	Rank.	Total Amount			Number.	Rank.	Total Amount.		
		Rs.	*A.*	*P.*			*Rs.*	*A.*	*P.*
2	First Class Subadars at ... Rs. 100 each	200	...	...	2	First Class Subadars at ... Rs. 100 each	200	...	...
2	Second ditto „ ... „ 80 „	160	...	.	2	Second ditto ... „ ... „ 80 „	160	...	...
4	Third ditto „ ... „ 67 „	268	..	.	4	Color Havildars ... „ ... „ 30 „	120	...	...
4	First Class Jemadars „ ... „ 37 „	140	..	...	20	Havildars .. ... „ ... „ 20 „	400	...	...
4	Second ditto „ ... „ 30 „	120	...		40	Naicks ... ... „ ... „ 15 „	600	.	...
40	Havildars „ ... „ 14 „	560	...	...	20	Lance Naicks at Rs. 2 in addition to Sepoy's pay	40	...	...
40	Naicks „ ... „ 12 „	480	..	..		Allowance of two European Battalion Officers ... ... at Rs. 100 each	200	...	...
	Color and Pay Havildar's allowances in 8 Companies ... .. at Rs. 7	56	..	.					
	Grand Total Rs.	1,984	...	...		Grand Total Rs.	1,720	...	...
		1,720		.					
	Difference Rs.	264	..	.					

Difference of expense monthly in favor of proposed Organisation Rs. 264 per Regiment.

The above statement shews the exact difference in the monthly expense. All ranks and establishments not mentioned above, being left as they are at present.

III.

The Mitrailleur as a Weapon for India.

THE point I wish to bring to the notice and consideration of my brother Officers, in the following paper, is my belief in the suitability of the Mitrailleur as a weapon adapted to the general conditions of warfare in India. In support of this view I have instanced the only well authenticated occasion of its use in the Field during the late Franco-German war, but it is not so much with the intention of pressing its merits as a weapon in the Field that I have done so, but by showing its great defensive power. I have attempted to point out that by arming our Fortresses with this weapon, we should have a larger force for offensive warfare at our disposal.

Not having seen any of the reports of the competitive trials at Shoeburyness, which were being carried on at the end of last year, I am unable to give any tabular statement as to the comparative targets of these Machine guns and those of the rifled Field guns and breech-loading rifles with which it competed; but as I believe the principle to be a correct one, I should not consider the result of these trials, (even if altogether unfavorable to the Belgian Montigny Mitrailleur, the one experimented on,) to be so detrimental as not to warrant further experiments being carried on, till the particular rifling of the barrel; diameter and weight of the bullet; and the quality and weight of the charge that would give perfectly satisfactory results, were obtained.

The French adopted the name of "Mitrailleur" for their weapon and retained it even after the introduction of the Belgian "Mitrailleur" into their service. In the paper, I have adhered to the latter name as being the original one, except when specially referring to the weapon used by the French, when for the sake of clearness I have retained their nomenclature.

Notwithstanding the many scenes of blood and butchery, that have occurred since July 1870, in which the Mitrailleur has had a share, I cannot help reverting to the first public trial of the effect of the fire of this weapon, as reported in the newspapers of that day.

The trial was carried on, as some may remember, against a group of unfortunate knacker's horses. The result of this inaugural trial led the way to that confident expectation of its wonderful success, as an offensive weapon of war, which formed in a great measure the source of that certainty of victory which the French Army then possessed. The Mitrailleur could sweep off a group of horses at a range of about 1,000 yards (if I remember right) in a few discharges, and naturally, it was to be expected that its use in the Field would produce similar results.

Let us see how far the action of the weapon has justified the expectations that were then formed. Up to the Capitulation of Sedan, there were only three battles, in which its use was reported. Doubtless there were many other occasions in which it must have been used,

but I have not been able to find any record of them. Nor are they mentioned in an article on the Mitrailleur which was published in the *Times* of September 8th, 1870.

The battles of Saarbruck, Wissembourg and Worth, at the beginning of the Campaign, in which the destructive power of the Mitrailleur should have been made so manifest, as to strike terror into the Prussians, only brought the weapon into disrepute by the latter, and its want of success must have acted prejudicially on the French Army, who had already begun to lose their *morale* in these successive defeats.

The cause of this failure it is not difficult to understand. In their anxiety to bring the weapon prominently forward, it was made to do work for which it was not suited, and when Artillery fire ought to have been used.

At Saarbruck, it was used chiefly at long ranges from the top of a precipitous hill, where the configuration of the ground prevented its use at short ranges, so as to prevent the position from being carried; and at Wissembourg and Worth, it was used against the troops concealed up to the moment of their attack in dense woods. In the first of these battles the position was not a well selected one, either for Artillery or Mitrailleurs; but the former would have made more impression at the long ranges, and in the other battles, shell fire, which could have penetrated into the woods, would have been evidently more destructive.

The German accounts of the battles praised the bravery of their troops, who had faced the fire of these machine guns, but all details of the loss they suffered from them was carefully kept unknown, and soldiers, after having captured a few, were taught to hold them in low estimation.

Most of the correspondents of the newspapers bore testimony to the fact that, where the bullets did strike they were more effective, in permanently disabling the wounded, than the bullet wounds of the Chassepot Rifle, which only kept the wounded a few weeks in Hospital.

It is thus, from the battle of Gravelotte, the last general engagement before Sedan, that we can learn how far the use of the Mitrailleur was of assistance to the French; and to do this, I will extract the short summary of the battle as given in the article in the *Times* that I have before referred to, which is taken from a description of the battle by the correspondent of the *Daily News*, who was present with the German Army on that occasion.

"The French were in position behind breast-works on a hill; their Artillery was planted some distance in rear. The Mitrailleuses appear to have been in line with the foremost works. The Prussians prepared their attack with a cannonade of 120 guns, and after half an hour's firing, the 33rd Prussian Regiment "dashed up the hill."

When they got half way up, Mitrailleuses opened upon them, and did terrible execution at close quarters. The men, however, pressed on,

though they literally fell by hundreds. They struggled on, and actually succeeded in forcing an entrance into the works. But the Mitrailleuses were not taken. Their lightness enabled them to be run back quickly some 400 yards, and then opened a tremendous fire from them and the guns, which had never been brought forward. The Prussians in their advance had pushed a half battery half way up the hill, but the Mitrailleuses fired so quickly and so well, that the 33rd were driven from the trenches so hardly won; the Mitrailleuses followed their retreat and inflicted terrible losses on them. The half battery tried to reply, but was overpowered and unable to retreat, because all its horses were killed. Then the Prussians, according to their system of sacrificing masses of men to gain their purpose, sent Cavalry at the hill to take it. In vain men and horses rolled over in the narrow road and they were in their turn compelled to retire. A cloud of skirmishers was next sent forward from the 67th Regiment of the line. The "men, well taught," crept from bush to bush, and from rock to rock, taking advantage of the slightest inequality of ground, to shelter themselves." A tremendous fire of Artillery supported their advance, and once more columns of troops were driven up the road, at the position. The brave soldiers got into the works, but the French fire was so terrible that they had to retire again. At half past 5, the Prussians seem to have run short of ammunition, for they desisted from the attack, and more cartridges and Artillery were brought up. A farm house, Da Villette, had been made into a strong position by the French, and commanded the hollow road, so a heavy fire of Prussian guns was brought on it till all their ammunition was exhausted, and at half past six their fire almost ceased. The quarter of an hour was spent in refilling the empty boxes and once more the cannonade began. La Villette caught fire, but the French still held the garden. At 7-20 the final attack began, the 72nd Regiment changed the slope, followed soon after by a Regiment of Hussars. After more than an hour's fighting in the dark, the French began to retire, the Mitrailleuses protecting their retreat. The letter of our Berlin correspondent shows that the carnage in this action had been frightful. In some cases nearly half the attacking Regiments had been killed and wounded."

Another quotation from the letter of a Prussian Officer taken from the same article, will show that the above estimate of loss must have been rather under the mark. He writes:—"The 1st Regiment of Dragoon Guards went first into fire, and were so slaughtered that only 120 men were left. The 2nd Dragoons were taken up to make up the number of the 1st and were in their turn cut down."

Though not mentioned in the short summary of the battle above given, the breast-works on the hill side were formed with a trench in rear, so that the Mitrailleuses which were placed in them were sunk up to the level of their muzzles, thus offering such a slight object to aim at, that all the effect of the "direct" Prussian fire could not silence them, nor was it till the position was turned by the Germans and the trenches were being raked by their fire, (this also is omitted in the account above given) that the direct attack which was last made, succeeded.

It is from this battle alone, that we can form an estimate of the capability of the Mitrailleur, and in this, its superiority as a defensive weapon on properly selected ground, stands prominently forward. The Germans began the cannonade a little after 11 o'clock, and from that time till after dark kept sending on fresh column after column of attack, but none of these succeeded even by sheer weight of numbers as in former engagements, in taking and keeping the position.

The chief difference between this and the previous battles, lay in the selection of the position, which was properly chosen, and further strengthened by field entrenchments, and was besides well defended.

The Mitrailleuses were on the slope of the hill, and the Artillery from the description above given must have been well placed, for the slope of the hill, not being too steep for Artillery fire, allowed every shot to plough its way through the advancing columns, whose path was marked by a dark trail of wounded, till the columns were obliged to retire, suffering double loss on their way back.

It is not too much to accord the greater part of this execution to the fire of the French Mitrailleuse, as this was the only battle where its services are distinctly recorded; in the previous engagements, the French Armies, though beaten on each occasion as they were on this, were not able to make such a stand against the overpowering attacks of the Germans. They fought equally well, (that is the Artillery and Infantry) for a time at each of the other battles, but they were driven off the field by the numbers of men brought forward by the Germans. Yet at this battle of Gravelotte, they were able to stand their ground all day and retreat forwards Metz under cover of the night. Clearly then, their effective use of the Mitrailleuses counterbalanced the preponderance in number of the Germans.

The question of their use in attack must be left for the next occasion, on which they are used with an attacking force, to be solved practically in the field; but I should think that under certain circumstances they could be used most advantageously. The Prussian Armies did not however use them, (I think the Bavarian army had some, but they never came sufficiently under notice for their doings to be recorded,) and though after the capitulation of Sedan, they could have turned out at least fifty of these weapons, armed and equipped as they had taken them, if they had wished to do so, yet it must be remembered that the Prussian Generals relied on their numerical superiority, and were not averse to losing men as long as their objects were gained. They were always the attacking force, and would not have gained much advantage, by the introduction of a defensive weapon, with which they were unacquainted, in the middle of a campaign.

In the present age of machinery, everything that tends to economize manual labor is considered an improvement; and we find in the Navy, and more especially in the merchant service, that steam power is applied to nearly every purpose which in former days required manual labor. The reduced Navy estimates are a source of congratulation to

the British tax payer who is called on to pay less for a more efficient Navy than formerly.

Of late years the Army has not been able to accommodate itself to the interests of the tax payers in the same way. Every alteration has been the cause of increased expenditure, without the corresponding benefit that was expected. For instance the last proposal, that no man under twenty should be sent to India, involves the expenditure of a pound on every volunteer, above that age, who will serve out here.

If this proposal be carried out, as I believe it will be, the first practical result that will arise will be a scarcity of men for service in India; and then in all probability will follow the formation of an army of India. Notwithstanding the speedier communications of the present day, as compared with the old days of the East India Company, there will still remain the problem to be solved of how to keep the British Army in India up to its full strength. Under the present system we are not able to gloss over this difficulty, as under the East India Company's regime, when for instance the number of gunners was supplemented by a detachment of Gun Lascars, and most of the field batteries were driven by natives.

In addition to the want of men to meet the ordinary demand for casualties, another consideration offers itself as an essential one, in the question of supplementing the numbers of the Army in India with machine guns like the Mitrailleurs. Unfortunately very few seasons in India pass without an epidemical attack of some kind. It is true that as many regiments as can be spared from the duty of defending the various positions in the plains, are sent to the hills, but by the introduction into the service of the mitrailleurs, the fortresses could be held with a fewer number of men, and thus enable more regiments to be located in the hill stations. This consideration, as affecting the general health of the troops, is one that ought to carry a great deal of weight in favour of the machine guns, if it can be shown that the defence of a fortress could safely be left to the small number of men necessary to manage the Mitrailleurs.

The Army of India has for its first duty, the defence of the country against internal disturbances rather than external ones, and is therefore a purely defensive Army. The few wars that have occurred of late years, on the various frontiers, have not been on a sufficiently large scale, to change this designation into an "aggressive" or "offensive" force. When however, the time may come for it to undertake active operations on a large scale, its strength will not be found quite equal to the double duties of attack and defence, I am referring to the British Army in India, as it is only to a portion of this Army that the defence of the arsenal and fortresses could be safely entrusted while the remainder are in the Field.

The extension of the Railway system too in India will form, in addition to the arsenals and fortresses, more strategical points than can be left to the sole defence of the Railway Volunteers.

With the number of men available it may be taken for granted that, not more than one regiment, assisted perhaps by a Garrison Battery, would ever be detailed for the defence of a fortress.

How far this would suffice for the defence of a fortress like Fort William may be seen, when the interior line of defence extends for more than a mile, and the exterior line of the covered way for about two miles. It would take at least ten regiments to man this extent of parapet, not counting the number of Gunners necessary for managing the guns mounted on the ramparts. Supposing now that the fronts and ditches were armed with Mitrailleurs, each one requiring three men to work it: if one man can fire off 37 barrels at once, he is for all defensive purposes equal to thirty-seven men; and though it takes three men for the effective management of the weapon, yet to be able to increase one defensive power in a ratio of 12 to one, is an advantage that ought not to be thrown away. Supposing the main ditches to be protected by these weapons, placed in (casemated) "Caponieres," the defence of the outer line of works might almost safely be abandoned, as the probability of a column attacking by storm, being able to cross the ditch before destroying the casemate, would be very slight.

If it be possible in time of war, by the aid of these machines, to enable one regiment to be equal for defensive purposes to twelve, in time of peace where a Garrison of a regiment has been considered absolutely necessary hitherto, at least two-thirds of the men could be withdrawn from the plains, the remaining third being, with the aid of their Mitrailleurs, fully equal to the defence of the post till relieved.

In the field, as I have written before, its practical use has to be discovered; but it must be borne in mind that its introduction into offensive warfare does not date from the late war, but that the original idea came over from America, where it was introduced towards the end of the Federal Campaign. I am unfortunately unable to quote any instances of its employment in that war, but the conclusion may be drawn, that the principle, not the gun, was adopted by the French on sufficiently satisfactory data to warrant the experiment.

As long as an enemy's Artillery can be brought into the field against us, it is necessary to have a better organized and more powerful Artillery to cope with it, and this will ever prevent the supersession of Field Artillery. A glance at the possible enemies that we may have to deal with in India shows only a few large territorially independent princes, who are able to keep up anything like an organized Artillery service, in addition to their disciplined regiments; but the greater portion of any internal enemy's force would consist of Light Cavalry and Infantry, and I see no reason why in the open plains of India, a well directed fire of Mitrailleur barrels should not be more effective against a mass of men than the fire of Infantry soldiers, especially at the beginning of an engagement in an open country: mobility of these weapons would enable them to protect (with the assistance of Artillery fire) all the preliminary

movements and dispositions of the troops, affording time for the latter to be effectively carried out.

It is well, however, to adduce the authority of an old soldier on this point rather than to submit any hypothesis of my own ; and I will conclude this paper by quoting an extract from a letter written to the *Army and Navy Gazette* in July 1866, by the late Sir John Lillie, K. C. B., who at the time of the Crimean war invented a somewhat similar machine gun, but was unable to get it introduced into the service. His invention consisted in placing six or more revolving rifles on a light platform cart ; these could be fired by turning a handle. A second set of chambers were to be loaded, while the first were being discharged ready to replace them, each chamber containing 20 charges; thus enabling 120 rounds to be fired in about a minute.

From the abovementioned letter I extract the following :—

"From my experience in command of a Rifle Corps under the late Duke of Wellington, I have pointed out the advantages of firing from a rest, owing to the quantity of ammunition uselessly expended in action from the want of steadiness in the mode of firing Musketry, and the constant movements of troops loading and firing while in a state of great excitement, with fixed bayonets, and without that steady support so essential in the act of firing to keep the barrels at their proper level ; the consequences of which have been, that scarcely one shot in several thousands has taken effect, as proved by the comparisons made in various Armies, between the quantities of ammunition expended in general engagements and the return of killed and wounded.

"In proof of the advantages of attaching rifle barrels, as well as pieces of heavier metal, to gun carriages, the superiority of Artillery over Infantry in striking objects in action, although at much greater distance, may be instanced; as, notwithstanding muskets being generally depressed or raised to a greater elevation than that at which field pieces are fired, the bullets either mostly fall short of their object or pass over the enemy's head, whereas a cannon ball seldom or never strikes the ground till it reaches the object aimed at ; facts which ought to have operated on the minds of the Ordnance Committee in favor of placing small arms in like manner on gun carriages, as thus recommended, which could thus be easily transported on the backs of horses or mules in mountainous countries, when field pieces could not be employed.

"The late Lord Herbert came to my house to see one of the above mentioned Batteries, with which he seemed much pleased, more particularly when I shewed him a letter from Major Vandeleur of the Artillery, under whose care one of these Batteries had been placed for trial at Woolwich, and who was so satisfied with the results, that he said that if he had had forty or fifty of them at the battle of Inkerman, where he was engaged, the havoc on the dense columns of Russians which closed on our troops would have been enormous, as in such a dense mass at close quarters a rifle ball would have passed through several men."

Had Sir John Lillie been alive during the late war he would have had abundant confirmation of the principle he advocated, of the advantage of firing rifle barrels from a fixed rest.

I do not feel so sanguine as to the use of these machine guns in mountain warfare, as the talented inventor was ; but it must be remembered that he was comparing the efficacy of his Battery, as he terms it, with either its advantage compared to the total absence of Artillery, or with such mountain guns as existed in his days. Since the time that his letter was written (1866) a rifled mountain gun has been introduced into the service, and found to answer in the Abyssinian campaign in every requisite. For the special defence of defiles and in some cases perhaps for outlying picquets, no doubt a Mitrailleur would answer admirably.

I venture to hope that this paper may have the effect of directing attention to the class of machine guns, like the Mitrailleur ; and that experiments may be carried out in this country not so much with a view of testing their comparative effects with regard either to Field Artillery or Infantry fire, though this would be useful enough in forming data to carry on practical trials, but it would be preferable perhaps to have their merits decided on their own special capabilities. When once these are clearly established, as I believe they will be, the time will not be far distant when every fortress will be strengthened by their introduction, and every division and brigade will have its batteries of Mitrailleurs.

JAMES COLQUHOUN,

Lieut. (Local Capt.) R. A.,

Commissary of Ordnance.

OPINIONS.

I.

On Articles I and III in Proceedings No. 1.

Memorandum on Soldiers' Dress, European and Native Infantry.

HAVING read the two essays, one by "Common sense," the other by Lord Lyon, in No. 1 of the Proceedings of the U. S. Institution of India, I beg to suggest one article of dress for the British Private's comfort and health and the consequent advantage of the State.

For head dress a Sola Helmet $\frac{3}{4}$ or 1 inch in thickness, strengthened inside by 3 or 4 thin strips of cane crossing at the top, covered outside with thin American Drill or Jean, and painted with oil paint; this can be of course of any color, white, drab, ochre, green, &c., and could be applied under Regimental arrangements.

The ventilation, as usual in Sola Hats; one so protected with paint, is impervious to drenching rain such as falls during the rains in India. I have seen such used out boating in the sun and rain in the season just mentioned, and therefore think there can be no head cover equal to it under *all* circumstances, for with a pugree neatly bound round, say of the color of facings of Regiment, it would look very neat.

Such Helmets could be made of any desired shape, and if required in large numbers could doubtless also be supplied cheap. There would be no harbour for bugs in them.

I would suggest that on a march a pair of light shoes, almost slippers, be carried (always, when a soldier wears his haversack;) they would be of very great comfort if men were allowed to put them on directly after a march, *even if they were on duty in camp*, as they could at once dry, and if necessary, grease and soften their boots. After a wet, muddy march, this would be a great boon and advantage.

No blacking tins or brushes are *wanted* on hard service; 1,000 pair of brown boots are as much uniform as 1,000 pairs of blacked ditto: greased boots throw off the wet; they are likewise soft, and being once greased, are unlikely to get hard quickly. Superfluous grease should of course be rubbed *off* simultaneously with rubbing it in. As soldiers are either not smart, smart, or very smart, in the matter of boots with blacking, so would it be with boots without blacking.

In the field or on hard marching, men have not much time or inclination to lay on *pipe-clay*. Buff belts would not *look well* without it, but buff belts absorb rain and then get soft and pull out, and get out of shape. Why not have brown leather; a very little "moom-roghan" well rubbed into (and any superfluous quantity rubbed off) would cause it to throw off the rain, and the belts would be less likely to pull out of shape.

I would also suggest that brown leather would be the best material for the gaiter.

For every Infantry soldier, *European and Native*, (except the Goorkhas who carry a "Kookree,") I would have a short heavy weapon to perform the many duties about camp or service; blade about 10 inches long, to be worn at back, over the left buttock, in a sheath.

Let each soldier have a couple of pockets, either in coat or in trowsers, or in both; a flap to those in coat if outside. Let each man have light iron tips to his boot heels, and the soles well studded with sprigs, *wherever each man treads most.* A boot which has commenced to wear down at heel and cannot quickly be repaired, soon goes to the bad, and the wearer most likely gets footsore and lame. Let each man be instructed in the mode of bandaging his foot with a long strip of linen, cotton or thin woollen stuff, in case of his socks getting worn out, and in case of his getting galled.

When marching (in Kashmir) I have, after putting a needle with *worsted* in it (thread wont do nearly so well) through a blister, and thus running off the water, put a strip of an old pocket handkerchief round it, with a little grease (butter or ghee) over the rubbed part, and so marched the next day again without feeling the slightest inconvenience, and the place has become healed in a day or two after.

Gaiter, some 10 inches long, reaching to about 8 inches from ground (and clear of the ankle as in sketch,) up to within an inch of the bend of the knee joint. The 'pyjama' as now ordered.

For cold weather, I would have it made long enough to fasten also just above ankle as in Fig. 2 in sketch.

The gaiter to be worn either with 'pyjama' fastened under knee, "a la Zouave," or over the ancle and worn under the gaiter, where warmth *and protection* (from rain, &c., as from jungle and thorns,) are *both* required.

Shoes of brown leather and of a native shape, coming more over the instep than many, and like those worn by Kabullees and men about Peshawur, stout made, and with tips to the heels. 1,000 pairs of such would look as uniform as 1,000 pairs of boots of English pattern.

Let a man wear what he can work and walk in. *For a native, a native shoe,* which he can kick off to rid himself of mud or dust. Native soldiers dont wear socks, as they cant generally afford them.

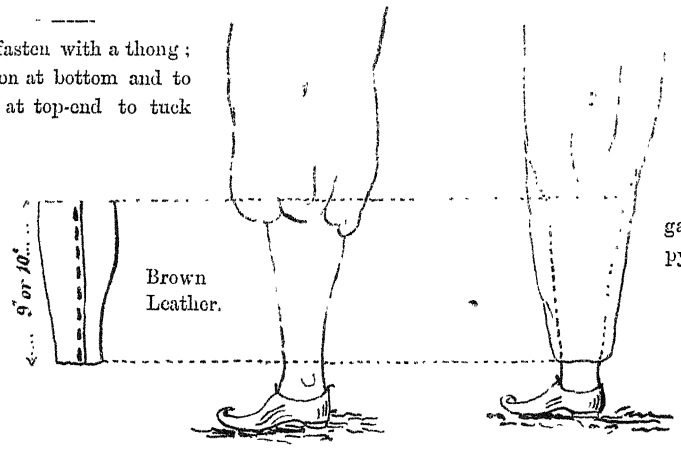
H.

NATIVE FOOT SOLDIER.

GAITER

FOR BOTH MEN.

To fasten with a thong; sewn on at bottom and to fasten at top-end to tuck inside.



Dotted lines show gaiter worn over pyjamahs.

SELECTIONS.

I.

Notes on the Vaziris.

THE following account of our turbulent yet gallant neighbours the Vazīrīs may be interesting to the Members of the United Service Institution of India. It is very difficult to get accurate information about these border tribes, and the writer would therefore claim for this account the indulgence of his readers.

The Vazīrīs are descended from Vazīr, son of one Sūlimān. Vazīr had two sons, 1 Khizrī, 2 Lali; Khizrī had three sons, 1 Mūsa, 2 Mahmūk, 3 Mubarak; Mūsa had two sons, 1 Utmān, 2 Ahmad, from whom are descended the Utmānzāes and Ahmadzāes, sometimes unitedly called Darvēsh Khēl. Mahmūd had a son called Mahsūd, from whom are descended the Mahsūds, and from his two sons, 1 Alī, 2 Balōl are the two grand divisions of the clan, *viz.*, 1 Alīzāes, 2 Balōlzāe. Mubarak had a son called Gūrbāz, from whom are descended the Gūrbāz Vazirīs, with whom we have little to do. (There a few camps of them in the Tochī Pass.)

From Lali, second of Vazīr, are descended the Lali or Leila Vazīris, inhabiting the slopes of the Sūlēdkōh.

The great branches of the Vazīrīs therefore are :—

I.—Utmānzae. II.—Ahmadzāe. III.—Mahsūd. IV.—Gūrbaz. V.—Lali or Leila.

I propose to treat each separately.

The most northerly tribe is the Leila, then the Gūrbaz; but these I will notice after the first three of the above divisions.

The Utmānzāe are the most northerly of Vazirīs with whom we have to deal.

They are divided thus:

			(*Clans*,)
Utmānzae ...	Mahmūd or Mahmīt Khēl,	Hasn Khēl.....3	divisions.
		Wūzī Khēl.....8	„
		Bārā Khēl.....2	„
	Ibrāhīm Khēl.....	Manzar Khel...2	„
		Mada Khēl.....3	„
		Torī Khel.....6	„
	Valī Khēl.....	Kāboḷ Khēl.....3	„
		Malikshāhī.....0	„
		Bakī Khēl.....3	„
		Jānī Khel.....2	„

The Mahmūd Khēl live in Ruzmak, Shum, on the Sukdas, and the Khasor.

Of these the Hasn Khēl live on the Kētī River, as do the Dūrdānī, an unimportant section.

The Wūzī Khēl live up to the S. W. of Dāwar.

The Bārā Khēl. (The whereabouts of this section is not known.)

The Manzar Khēl chiefly reside in the Margha at the head of the Tochī Pass W. of Dāwar, and in a portion of Shehrna.

The Mada Khēl inhabit the country near the Gon Mountain S. of Dāwar, a portion of Shehrna and of the Sheratala, a plain. They number 2,000.

The Torī Khēl are found in Ruzmak, in the Khasōr valley, parts of Shakhdū, and on the Sheratala plain. The Torī Khēl have never, I believe, given any trouble. Taylor mentions that they have a feud with the Mahsūds. They number 3,250. They have "Kiris" in the mouth of the Sakdū Pass.

The Kabal Khēl are divided into 1 Miamī, 2 Saefalī, 3 Pepalī and number about 3,500 fighting men. They inhabit a part of Shawal, and (Miamī section) the upper part of Shaki, and (Saefali and Pepalē sections) in the summer the Birmūl valley and a part of the Sheratala plain, and a considerable portion of country on the East bank of the Kūram in the Khatak lands.

They are at feud with the Tūrīs, friends with Biland Khēl and enemies of Thal. The Tūrīs side with the latter.

The Kābal Khēl section of the Utmānzāe, inhabit the N. portion of the Vazīrī hills on both banks of the Kūram. They overlook the W. portion of Miranzāe and adjoin the Bahādur Khel sub-division of Kōhāt. They are a wild lawless set. They are always ready to join with the Turis, Zaemukhts, and Orakzaes, in any devilry or mischief. In the autumn of 1850, they signalised themselves by an audacious attack on Bahadur Khēl and its salt mines. They were promptly driven off. They had no reason, no provocation had been given, for this attack. A fort was then built at Bahadur Khel, that village being held in force till it was finished. The Kabal Khel gave all the opposition in their power, and constantly harassed the workmen, and on one occasion they attacked the village of Bahadur Khel, but were roughly handled by the villagers. From this time to 1854, they committed no less then 20 raids into the Kohat district and Khatak hills. They were then blockaded by Coke, and two parties of them with their cattle were seized. This brought them to their senses, and they paid a fine and gave hostages. After this they were more careful in their behaviour. But on the 5th November 1859, Captain Mecham of the Artillery was murdered near Latamr, by a party of Hatī Khel, Ahmadzae, Vaziris, who were traced to the Kabal Khel. They refused to surrender the murderers. Accordingly on the

20th December, a force consisting of 4,000 men and 13 guns collected crossing the Kuram at Thal and entered their country. Their encampment at Maidani 8 miles W. from Thal was burnt, and large stores of grain, together with some flocks of sheep, were captured. They showed some gallantry in defence, lost 50 men killed and wounded, our loss being 1 killed, 14 wounded. The Turis of Kuram assisted in the pursuit and plunder. The country on both banks of the Kuram was thoroughly explored and mapped by the Survey Officers. The Hasn Khel and Turis Khel on the banks became responsible for the apprehension of Zang, one of the murderers. The Gangi Khel section of the Ahmadzaes actually gave up one of their own clan who had harboured the murderers, and ultimately the principal murderer named Mohabat was given up by the Ahmadzaes and hanged. The troops remainded about 20 days in the country of the Kabal Khels. The Kabal Khel were also mixed up with the Tazi Khel Ahmadzaes in an attack on the village of Thal in 1866, see Tazi Khel section.

Cavagnari, writing of the raid of the Vaziris in 1866 on the village of Thal, says, "on the other hand, the Kabal Khel have of late years given a great deal of trouble especially on the Banu frontier, and the account against them is long standing and heavy. Their trade is principally in the Khost direction, and they do not suffer as much as the other Vaziris by exclusion from trade with our territory. But they have very valuable crops (ripe in April-May,) beyond the village of Biland Khel and the destruction of these would inflict a loss of upwards of Rs. 20,000. In May they are almost isolated from the other sections, but in the autumn the other sections return to their settlements and the difficulty of punishing them is consequently much greater then."

About 300 of the Malik Shahis cultivate in British territory, being mixed up with the Jání Khél. The rest are situated in Shehr Khaní and the upper parts of Shawal and Shakí.

The Baki Khéls are all in British territory during winter. They are divided into 1 Sardi Khél, 2 Takhtí Khél, 3 Narmi which are again sub-divided into numerous sections. They number about 1,200 fighting men.

The Baki Khél go in summer to the lower parts of Shawal, their ancestral lands

The Baki Khèl, says Taylor, have always been an excessively well behaved tribe, have paid their revenue regularly, and have not only refrained from plunder themselves, but have always refused a road to the evil disposed thro' their "Kiris." Urmston does not say anything contrary to this. The lands of the Takti Khél lie on the Miri sub-division on the N. bank of the Tochi River and round the Tochi out-post, and below it, opposite the Madan sub-division (Banu) on the S. bank.—The Sardi Khél lands lie in the centre of the large Thal between the Tochi out-post and the Jáni Khél lands, and the lands of the Narmi Khél adjoin those of the Sardi Khél.

Thus the Baki Khél cultivate extensively on both banks of the Tochi and their grazing grounds extend from the Great Baran watercourse opposite the Mindú Konai Range, into Dáwar, to the lands of the Jáni Khél near Vali.—They are responsible for the Tochi pass (in consideration of which they are allowed to have four Sowars in the Frontier Militia,) and for all the passes between the Baran and Khisór. And they are also responsible, jointly with the Jáni Khéls, for the "Khaissra" and "Khisor" passes: the former situated between the ranges of hills called Ishmail and Ucha which open in front of Mirian; the latter bounded on either side by mountains called Rucha and Mangi.

In the Khisor pass, which the Baki Khél share with the Jani Khél, there is said to be a wall of rock which prevents the water, which should be shared between these sections, from coming down to the lands of the Jani Khél, who are consequently said to be very anxious for its removal.

The Jáni Khél number 1,000 fighting men, and are divided into two sections, *viz.*, 1 Tor (black), 2 Sor (Red), which are again sub-divided into minor and unimportant sections, as Mohmit Khán Khél, Hindí Khél, Reshmea Khél, Bachakáe, Idia Khél. Some of the Jani Khél go in summer to the lower part of Shawal.

The Jani Khéls number 1,000; cultivate on all sides of the Fort Jani Khél and between the Khasor passes. They have four Sowars in the Frontier Militia and are responsible for the Khasor, Shaktú, and Karstú passes. They have on the whole always been a well-behaved tribe, always paying their revenue, and only been guilty of petty thefts. It is said that they are very anxious to draw themselves closer to the British, an end which the removal of the rock in the Khasor pass above mentioned would, it is believed, do much to compass.

The other sections which are mentioned by different authorities, *viz.* Dúrdáni Machi Khél (by James), Wangharwallee (by Lumsden), Sugdye Eusogye, Battye, Khosallye, Shah Meerye, Bobalze, Meer Alye, Toowal Khél and Moot Khél by Edwardes are, where existent, probably subsections which have not attained any importance. MacLean suggests that the 'Wargharwullee' section of Lumsden may be a misnomer for Woorghurral, a section of the Bitansis.

The strength of the Utmánzaes then is as follows:—

Hasn Khél.....	1,100
Wuzi Khél.....	800
Bara Khél	2,000
Manzar Khél.....	800
Mada „	2,000
Túrí „	3,500
Kábal „	3,500
Malikshái	?
Bakí Khél	?
Jání „	?
Total,...	17,200

The total then of the Utmanzáe Vazírís, is

Beyond the border.....	14,700
Within ditto	2,500
Total, ...	17,200 fighting men.

The Ahmadzáes are divided thus :—

- Ahmadzáes.
  - Shín Khél ... { Hatí Khél..... 2 sub-divisions. / Sirki Khél ... ... 2 ditto. / Umarzáe ..... 2 ditto.
  - Kalú Khél .....
    - Nasrí Khél...
      - Búmí Khél, { Tazí Khél. / Zalí Khél. / Gangí Khél. / Alí Kháni.
      - Shadí Khél { Khojal Khél / Khúnía „ / Bodín „ / Bízùnd „ / Paéndeh „
    - Spírkáe ..... { Mahamad Khél / Sudûm „ / Sada „

The Hatí Khél is all within British territory; they number 1,500, and reside on the Vaziri Thal, N. of the Kúram.

Some of the Hatí Khél go in the summer to the Shakí plain. They also extend back to the Kafir Kot range, and have their "Kiris" scattered about in the various intervening "nullahs." Their principal settlement is Chapari which is shared by the Utmanzáes, who, with them, control the communication from the Kúram to Thal *viâ* Gúmatí or the Barghamatú. A few other tribes have settlements also between the Hatí Khéls and Utmanzaes. But the quiet of the That border and even the neighbouring parts of Marwat, depends on the good behaviour of those two clans.

The Hatí Khéls were deprived of most of their ancestral land in Shaki by the Khojal Khels and Spirkae, consequently they can hardly go up as usual until they make up their difference which has placed the whole of the Shin Khél at variance with the Kalu Khel.

The Hatí Khél is a strong and important tribe and occupy rather a distant position from Banú. They cultivate lands on the Thal under the Barghamatú and Chashmeh springs and also in the neighbourhood of Súr. Their grazing lands extend from Barghamatú on the one side to near Zerkáe in the Khatak range on the opposite side of the valley. They are very much employed in the Salt trade and are not by any means an ill disposed tribe generally, but they have so many idle hands amongst them that it is not wonderful that some mischievous characters should be found among them. The actual murderers of Captain Mecham

on 5th November 1859, were of this clan, but they belonged to a gang of robbers sheltered by the Kábal Khél Vazírís, and this section had nothing to say to the murder.

Of the Sirkí Khél, 200 are located within British territory and the rest are beyond in the hills S. of the Khisor pass.

Those beyond the border number 300 men, some of them living in the Waunch valley.

The Umarzáe number 600 and are all situated in British territory. That is to say, they all have lands in British territory. They also extend back between the border and the continuation of the Kafir Kót range where it cuts the Kúram. They have a village up there called Gúmatí. They extend to the East and join the Hatí Khéls at Chapari at the head of the Barghamatú, on these two therefore depends principally the freedom or otherwise of the Thal from raids. While they remain quiet and well disposed nothing can approach from the Kúram or from the N., without their knowledge. Their "Kiris" and flocks are in every ravine.

Their own ancestral lands lie in the Sakdú near its head. Their lands are called Spírkae and Rasto Bazina.

They are surrounded by Mahsúd with whom they are on fair terms, but they often have cattle stolen by them. They are the best armed of the Ahmadzaes.

The conduct of the Umarzáe division of this clan has not been always so exemplary as that of others. Like other Vazírís they at first cultivated in the Banú Valley lands which had been wrested from the Banúchís of the neighbourhood. But owing to a misunderstanding about revenue matters, they began a series of aggressions; 1st, on the 3rd December 1849, they attacked the V. of Bazid Khán 3,000 strong, and killed several people, 2nd, soon after, they attacked 500 strong, the post of Gúmatí, but were repulsed by Mr. Macmahon; 3rd, again in February 1850 they attacked it; 4th, having induced the Mahsúd Vaziris to join them, they in November '50, made a formidable demonstration with several thousand men, intending to attack the town of Banu itself; but finding a strong force ready for them, they assaulted some border villages but were repulsed. In December '50 again they carried off a supply of supplies proceeding to a British camp. In 1851 they induced the Kábal Khel Vaziris to join them and appeared with 2,000 men, but retreated before the British outpost. Within the same year they attacked a police post and also a baggage party. Efforts were made to settle matters with them, but they continued, not only to threaten over attacks, but also to rob and murder by stealth. So after three years of open hostility on their part to the British, an expedition was undertaken against them with a force of 1,500 men. The affair was planned by Major Nicholson and was successfully executed. The Umarzáes were surprised in the fastnesses of their well-known hill of Kafir Kot, three of their principal villages and one encampment were destroyed. Thoroughly humbled they sued for peace and re-admission to their lands in the valley. An inter-

val was allowed to elapse in order that their patience might be tested. Their conduct being quite satisfactory, they were re-admitted during 1853, and are now as good cultivators as any section of the Vaziri tribe.

The Tází Khél number 1,750 and reside on the Khatak hills, Kohat district in winter; in summer they go up to the hills west of Gomal.

We do not appear to have had much to do with this section till quite lately. Taylor said they "do not give much bother, but some of them occasionally join with the Kábal Khél in a raid. The section is generally trustworthy and respectable.

On the 5th March 1866, the Tazí Khél Vaziris were preparing to return to their summer quarters, when they were drawn into an ambuscade of their enemies, the Túrís, near the village of Thal. The Vazírís were overpowered and lost 13 killed and 6 wounded. After stripping the bodies of their arms and clothes, the Túrís retreated to their own country before the Vazírís could assemble. The Vazírís believed that the inhabitants of Thal who are Gar and friends of the Túrís brought the latter down on them. Accordingly, a body of Vazírís, principally of the Kábal Khél sections attacked the village of Thal and succeeded in carrying off 700 or 800 head of cattle.

Captain Cavagnari then demanded restitution of the stolen property; the Vazírís flatly refused. A force consisting of 2,600 levies and one wing of Cavalry, three wings of Infantry and two Batteries of Artillery, was moved out under Colonel Keyes, and reached Thal on the 22nd. The Vazírís then gave in; each of the above sections paid a fine of Rs. 200, and moreover agreed to make good the value of the property stolen or destroyed, *viz.*, Rs. 6,486, giving hostages from the Mámí, Pipalzáe, and Salphati sections, as a guarantee of payment: the troops then returned.

The Tazí Khél can be sufficiently punished by prohibiting their grazing in the winter, as they have nowhere else to go, being at feud with the Ghilzáes and Turís and the snow prevents their remaining in the hills.

The Zalí Khél live near the Gomal Pass, or lands, which have come down to them from their forefathers, and also in Gendni and Zangara.

The Gangí Khél number 550, and are scattered about the Zangarah ravine and Wallae ridge of the Káfar Kót range N. of the Kúram. Taylor says, they are always deeply engaged in the Salt trade, but are always ready to join in any mischief that is going on with the Kábal Khél and Hásn Khél (Utmánzáes.) Some live in the Wauneh valley.

The Alí Khaní are all beyond the British border.

They also come to settle for the winter in the Kohat district among the Khatak.

The Khojal Khél are all beyond the British border. Taylor says they are deeply engaged in the salt trade, but are apparently always,

ready to join in any mischief that is going forward with the Kabal Khél and Hásn Khél (Utmanzae) ; one of the Chiefs of this section has some land in Banú district.

They number 1,200 and reside on the banks of the Kúram from Thal towards Hangú. Some of them live on the Wauneh valley, and in the winter many of them come into the Kóhát district among the Khataks.

The Khúní Khél number about 400 fighting men, and are all beyond British boundary, living at Tarap near the Kúram 16 to 20 miles from the Frontier. They also inhabit the lower part of the Shakía plain, some also live in the Wauneh valley and on the Zangara Nala.

The Bodín Khél number only about 80 men and are all in British territory, their land being on the Thal mixed up with those of the Spírkáe. Some of them go in summer to the lower part of the Shaki plain.

The Bísúnd Khél number about 600 men. They are a very well behaved respectable tribe. They cultivate some land in a valley in the hills called Pìng which lies to the N. of the Gúmati pass between that and Bargamtu. They have never been hostile to the British Government. Some also live in the Wauneh valley. Their ancestral possessions are in Badr. The Moghal Khéls never come down into British territory like the rest of the Bízún Khéls.

The Páendeh Khél number 200; they have lands in British territory on the Dhamai Thal mixed up with those of the Spírkáe. Some of the Páendeh Khél live in the Wauneh valley. The Bízún Khél, Páinde Khél and Bodín Khél are always ready to stand together.

All of the Spírkae sections, *viz.*, Mahamad Khél, Sudam Khél and Sadi Khel (except a few of the last who are great robbers,) are in British territory. They number 1,100.

The Sudam Khel is the section of Swahn Khan so well-known from Major Edwardes' book on this Frontier. Some of this section go in the summer to the lower part of the Shaki plain. The Spirkae have always been a well behaved section, until the defection of the Mahad Khel branch in 1870, of which the following is an account:—

In the beginning of 1870 or end of 1869, a bunneah was carried off by the Kuram pass, for which the Mahamad Khels were responsible. They were heavily fined for this. Shortly afterwards the Kuram went very low, and the Mahamad Khels were sent by the "Tehseeldar" of Buuu, Ata Ulla Khan, to repair a "bund" which diverted the little water that remained on to Banuchi land. They did this grumblingly because their own lands were dry,

They shortly afterwards burst the "bund" and seized the water for themselves. They were fined again for this. They then prepared for "badi."

They went off to the hills as usual, and stopping about a day's journey beyond the border, they returned and attacked a guard of Infantry on its way to the Kuram Post, killing six of them. Ever since then they have been giving trouble.

The total strength of the Ahmadzaes is as follows :—

Hati Khel,...	1,500
Sirki Khel...	500
Utmanzae,...	600
Tazi Khel,...	1,300
Gangi Khel, ...	500
Ali Khani, ...	100
Khojal Khel, ...	1,200
Khuni Khel, ...	400
Bodin „	80
Bizund, „	600
Paendeh „	200
Mahamad „	600
Sudam „	400
Sadi „	200
Total,...	9,580
Or, Independent ...	4,850
Within the border,	4,430

All of the Vaziris mentioned above as residing in British territory have settled down into good cultivators and pay their revenue with praiseworthy regularity.

Within the last few years they have become very eager to possess themselves of as much land as possible, and are not unfrequently to be seen in the British Courts litigating for their rights with as much enthusiasm and not less noise than a Banuchi, for this Thal tho' sandy is very favorable for the Rubbee crops and in some parts produces also good Khareef. During the early days of British rule, Major Taylor, the Deputy Commissioner, induced this tribe to settle by giving them grants of land. They are described as behaving themselves very well, and have furnished a police post in the midst of their camps for the better establishment of order amongst them.

The following statement shows in detail the extent and value of the land occupied by these Vaziris in British territory, and the amount of revenue paid by them:—

Sudam Khel including Paendeh and Bodin Khel	6,525	acres.	8,968	Rs. reduced.	1,685	Rs.	Revenue.
Mahamad Khel...	1,205	„	9,213	„	709	„	
Hati Khel,.....	3,761	„	14,855	„	1,635	„	
Sirki Khel, ...	566	„	787	„	213	„	
Umrzae	1,861	„	1,376	„	735	„	
Khojal Khel	417	„	1,716	„	101	„	
Total Ahmadzaes	15,572	„	55,335	„	5,864	„	
Jani Khel and Malikshahis.....	1,937	„	6,637	„	500	„	
Takhti Khel ...	2,076	„	5,278	„	465	„	
Narmi Khel ...	750	„	2,104	„	326	„	
Sardi Khel ...	1,085	„	2,774	„	506	„	
Total Utmanzaes	5,848	„	16,793	„	1,806	„	
Grand Total Vaziris.....	21,420	„	72,128	„	7,670	„	

Edwardes thus describes the emigration of the Ahmedzaes to the plains of Banu. " A multiplying people, increasing flocks, and insuffi- " cient grazing grounds, first brought these nomads into Bunu about " thirty years ago.

" The Thal, too dreary and barren for the softer Banuchi, was to " them a tempting space ; they drove down their herds into it, and " pitched their black blanket tents ; the flocks fattened, and the winter " which raged in their native hills passed luxuriously away in these new " plains. The spring sun rekindled the love of home, and made the " goatskin cloak hang heavy on the shoulders of the mountaineer, and " the sheep to bleat under its fleece. The tribe turned their faces to- " wards Speenjha ; and the Bunnoochee thieves, hanging on the rear of " their march to the very borders of the valley, were afraid to venture " within the range of the 'juzails' of the Ahmudzaes, and the strangers " went away unchallenged.

" Again and again the winter brought them back, and in occasional " collision between the savage of the plain and the savage of the moun- " tain, the Vizeeree proved ever the savagest, and became a name of " fear and hatred in Bunnoo. At length the Vizeeree cast his eye on " the Bunnoochee fields and harvest, and became possessed with the " lust of land. So he proceeded in his rough way to occupy what he " wanted, which, for the convenience of being within reach of his own " people, he chose nearest to the Thull ; and when the Bunnoochee own-

" er came to look after his corps, he was ' warned off' with a bullet as " a trespasser. A sad era was this in Bunnoochee annals. Hushed were " all private feuds now, for the lion had come among the wolves : Mul- " lick after Mullick was being robbed.

" At length the two great ' goondees' laid aside their differences " and met in high council on the dilemma. Then had been the time to " fight, and fight desperately, ere the intruders had taken root ; and " some voices did cry out for war, but the chiefs of the two ' goondees' " knew their strength, and that the whole valley could not muster twen- " ty thousand men. On one side, their neighbours were afraid to assist " them, for their little valley was nearer than Bunnoo to the Vizeeree " hills. The brave men of Murwut, on the other side, were scarcely less " hostile than the Vizeerees. The Vizeerees themselves could summon " forty thousand warriors. The ' council of war' as usual resolved on " peace—" tempered," as Talleyrand said of the Russian despotism, by " assassination." They would not fight the Vizeeree tribe, but they " would harass individuals with matchlock, knife, and ambuscade, and " make occupation or cultivation impracticable.

" They little knew the Vizeeree temper. The first act of treache- " rous hostility drew down a fearful and bloody retaliation. Where at " first only a field was gone, now a home was desolate : and so both " sides continued ; the Vizeeree encroaching, the Bunnoochee resisting ; " the Vizeeree revenging, the beaten Bunnoochee retiring in despair. " At length even this found its limit. Both sides grew weary. Only a " few Vizeerees cared for the new toy of cultivation and many came to " compromise with the owners for small sums of money, inadequate, but " better than nothing. The Vizeeree intruders built forts like those of " the Bunnoochees on the plundered lands, and with the usual facility of " revolutions in the East, soon passed into undisputed proprietors " of some of the best tracts on the left bank of the Koorrum. But they " never mixed with the Bunnoochees, either in marriage, religious cere- " monies or the more ordinary affairs of life. Had the Bunnoochees been " less wronged, the Vizeerees would have been still too proud to mingle " blood pure as the snow on the Sufeyd Koh, with the mongrel lowland " tribes of Bunnoo. Proud, patriotic, and united among themselves ; " austere and simple in their own manners, but hospitable to the stranger, " and true to their guest against force or corruption, the Ahmudzyes " stood aloof from the people they oppressed, and looked on in contempt " at their cowardly submission, their disunited efforts against the Sikh " invader, their lying dealings with each other, their treacherous assassina- " tions at the board, and the covetous squabbles with which they converted " into a hell the heavenly valley given them by nature."

" I must not conclude this sketch of the Vizeeree settlement in " Bunnoo without mentioning, that as the Ahmudzyes have occupied " (besides their seizures in the tuppehs) the Thull on the east, and the " waste under the hills on the north of Bunnoo, so their countrymen of the " Otmanzye branch have felt their way down from the western mountains

" to the waste lands which lie about the banks of the Tochee, scraped out " of them a little precarious cultivation, and built a few forts to protect " them from the Bunnoochee owners in the adjoining tuppehs of Meeree."

The Mahsuds are divided thus:—

- Alizae 6,400...
  - Poti Khel 3,500
    - Shabi Khel, ... 1,200
    - Monzae „ 1,300
  - Shaman Khel 2,900
    - Juliar Khel, ... 600
    - Khati „ 500
    - Badinzae 800
    - Gulshahi, ... 1,000
- Bololzae 8,100...
  - Haimal Khel 4,200.
    - Abduli, ... 2,500
    - Malikshahi 800
    - Nagur Khel, ... 900
  - Band Khel 300
    - Aikam Khel.
    - Tutia „
  - Nana Khel 2,400.
    - Haibat „
    - Umar „
    - Alikhani „
    - Mir „
    - Manda „
    - Burta or Buruti.
    - Mehr Khani.
  - Shingi 1,200.
    - Mahamadi.
    - Joki.
    - Mallai.
    - Babali.

Total,.....14,500.

All the Mahsuds are beyond the border: an attempt was made to get them to settle like the Darvesh Khel, but it has not been as yet successful.

The above numbers are taken from Mahamad Hyat Khan. The Nawab of Tonk makes the Alizae to number 7,600 and the Balolzae 6,000.

The Mahsuds command the Ghwalari Pass and have long been in the habit of attacking the Povindah caravans, but as they are generally sure to get as good as they give, there is a limit to these attacks. In the Sikh time their raids into the plains were frequent and once they burned the town of Tonk.

From annexation to the date of their expedition against them in 1860, their conduct is well described in General Chamberlain's despatch of the Mahsud campaign. "Lastly, he says, come the Mahsuds, who of

"all three branches are pre-eminent for living by plunder and violence, "and trusting implicitly to the inaccessibility of their mountains, their "conduct from first to last has been outrageous. To go no further back "than the five years I have commanded on this frontier, the police reports "of the District Officer record against them the commission of 184 crimes "of a heinous nature." In addition to this list, in March 1855 a native officer and 12 troopers, pursuing too far into the hills, were surrounded and destroyed; and in November of the same year some 3,000 of the tribe assembled in the pass in front of Tonk with the intention of plundering that town, but were foiled in this object by troops arriving by a forced march of 50 miles. So far back as the spring of 1855, the Chief Commissioner, becoming impressed with the injuries committed by the Mahsuds, recommended that a force be sent against them in that autumn. In February 1857 Sir John Lawrence again found occasion to recommend that retributive measures be no longer delayed, and Government sanctioned their being undertaken; but again circumstances arose to prevent their being carried into execution.

Emboldened by years of immunity and believing that they could successfully oppose any attempt to penetrate their mountains, they, on the 13th March last, without provocation or pretext of any kind, came out into the plains to the number of some 4,000, headed by their principal men with the intention of sacking the town of Tonk. Fortunately the Cavalry outposts in the neighbourhood had sufficient warning to admit of 195* sabres being collected to meet the inroad; and through the skill and boldness of the Native Officer who exercised command, and the gallantry of all ranks, this body of disciplined and well-armed men met and drove back the marauders to the hills; making them leave upwards of 100 dead on the field, besides a large number of wounded, at a loss to ourselves of a few men but many horses. This outrage was considered as filling up the measure of their offences. His Excellency the Viceroy and Governor-General ordered that a force should enter their mountains, and there exact satisfaction for the past and security for the future.

* 5th Regiment Punjab Cavalry ...158
Mounted Police.. 37
Total.....195

"On receipt of the order for conducting military operations, steps were at once taken to assemble the necessary troops; and on the day month that the marauders emerged from their mountains to sack Tonk, a force pitched its camp upon the scene of their disgrace, preparatory to penetrating their stronghold in search of redress; but prior to moving, a proclamation was sent to the Mahsood Chiefs, to announce the object for which the Government forces entered their hills; to tell them, that within a fixed period, they were free to attend the camp for the purpose of learning the demands of the British Government; and that, on their failing to appear, or not complying with the demands, they and their tribe would be treated as enemies and punished; and that their blood would be upon their own heads."

The above extracts from Brigadier General Chamberlain's report explain "why the operations now detailed were undertaken, and show "that, before entering their hills, every opportunity was afforded the tribe "to come to terms, but in vain; they had taken their course and adhered "to it. No reply was received to the Brigadier General's proclamation. "Reports reached camp that the Waziris were assembling within a few "miles of the plains. Further delay was to be "avoided; and accordingly, on the morning of the "16th Brigadier General Chamberlain struck his "camp and with a force of 5,166* fighting men "crossing the border by the Tank-zam entrance "opposite Tonk."

* Staff.....	8
Sappers and Miners	478
Artillery.....	237
Cavalry	339
Infantry 4,134	
Total...	5,196

"Meeting with no opposition, the force, on the 18th idem, reached a "walled village called Shingee-ka-Kote, about 28 miles from Tonk On "the approach of our Cavalry a small party of Wuzeerees who had been "left there, quitted the village. One was killed, a few taken prisoners, "and some head of cattle and 200 sheep were seized on the hill side.

Take possession of Chundala.

"A body of the militia was located at the village of Jundola at the "western mouth of the Tunis Tunga, to keep open "communication with Tonk, and thus ensure the "passage of supplies, &c.

Force divided and a portion left under Col. Lumsden at Paloseen.

"Before moving upon Kaneegorm, it is determined to penetrate the "Shahoor and Koondeeghur mountains; but to "retain possession of Jundola and keep open "communication with the rear, it became neces-"sary to divide the force;—and, accordingly, a "detachment of the strength marginally noted "was left at Paloseen, 4 miles in advance of Jundola, "under the command of Lieut-Col. Lumsden, C.B.

4 Field Guns
100 Cavalry
1,564 Infantry.

General Chamberlain moves towards Shahoor.

"On the 20th Brigadier General Chamberlain, with the greater por-"tion of the Cavalry and Infantry and the "mountain guns, supplied with provisions for 8 "days, moved towards Shahoor. The gorge was "unoccupied, save by a small party of the enemy, who retired as our "Infantry ascended the heights, causing by their fire, however, a few "casualties. The defile is described as narrow and difficult, and about 3 "miles in length, the hills on either side closing in so as to render "artillery of little use. On emerging at the western end of the gorge, "Major R. Taylor, whilst reconnoitreing the road ahead, came in broken "ground upon three Wuzeerees, who attacked his party and wounded "three men and some horse before they were killed.

Further Progress.

"On the 22nd the force reached Burrund, at the foot of the Khoondee-"ghur mountains, and on the 23rd Jungee-Khan-ke-"Kote, a distance of about 24 miles from Palooseen.

"Jungee Khan, the principal Chief of the whole Mahsood tribe, with "his son and nephew, had fallen the previous "month in the attack upon Tank. His fort was "now blown up, and village destroyed. The resi- "dence of a neighbouring chief who was known not to have participated "in that outrage, was spared.

Fort and village of Jungee Khan destroyed.

"Having now seen the greater part of the south western portion of the "district, and burned the crops, the force proceed to "retrace its steps, in view to joining Lieut.-Colonel "Lumsden's column, prior to an advance on the "capital.

General Chamberlain returns to join Col. Lumsden.

"As the Troops were falling in for this purpose on the morning of "the 24th, a despatch was received from Lieut.- "Colonel Lumsden, reporting the successful repulse "of an attack made upon his camp at dawn the "previous day by a body of 3,000 men.

Attack on Col. Lumsden's camp.

"The absence of opposition to Brigadier General Chamberlain's "advance was thus accounted for. It appears "that the Wuzeerees had assembled in two large "bodies; one to defend the passes in the more "immediate neighbourhood of their capital, the other to attack the "numerically weaker camp at Paloseen.

Absence of opposition to Genl. Chamberlain accounted for.

"But the latter move was eminently unsuccessful. Although in the "first rush the vastly superior strength of the "Wuzeerees enabled them to annihilate the "pickets, the advance of the great mass was "quickly checked by Lieut. Colonel Lumsden, at the head of an in-lying "company of Guides, About 500 of the bravest of the band, however, dash- "ed into camp, cutting down all within their reach.

Colonel Lumsden checks attack on his camp.

'The attack was so sudden and unexpected that some slight confusion "prevailed, but the Guides were quickly rallied "by Lieutenants Bond and Lewis, who bore the "Wuzeerees back at the point of the rifle sword, "killing many and clearing the camp.

The Wuzeerees borne back by the Guides.

"Whilst this was going on on the right, Major Rothney, in command "of the Goorkhas, supported by the 4th Sikhs, "advanced on the enemy's flank down on the "mass of Wuzeerees with admirable steadiness. "When clear of the camp, the Guides joined this force, and Lieutenant "Colonel Lumsden with the detachments of the three corps, pursued the "enemy for fully three miles over the hills, inflicting severe punishment, "until they broke and dispersed.

Major Rothney's advance on the enemy's flank.

"Though our loss* in this affair was considerable, that of the enemy "was much more severe. 132 "dead Wuzeerees having been "counted in and about Camp, "and on the line of retreat.

Loss in repelling attack.

* Fighting men killed,	21
Ditto wounded,	109
Camp Followers killed,	16
Ditto wounded,	23

"Lieutenant-Colonel Lumsden reported in the hightest terms on the "conduct of the Officers and troops engaged in "this affair. Major Rothney, commanding the "Huzara Goorkha Battalion, in particular, seems "to have distinguished himself for promptness of decision and correct- "ness of judgment.

Conduct of the Officers and men engaged in repelling the attack.

"To revert to the main column, which had commenced on the 24th to "retrace its steps, it met with no opposition in its "return; but as the attack on Colonel Lumsden's "camp showed a determined hostility on the part of "the Wuzeerees, it was deemed necessary to destroy such crops and "villages as had been spared on the occasion of the advance. The two "Columns were re-united on the 26th, and, the camp was pitched at "Mundani Cuchee, a mile and a half above Paloseen.

Return of the main Column.

"From the 27th to the 1st of May the force remained halted, to admit "of the sick and wounded being sent back to "Tank, and for the litters to rejoin preparatory "to an advance on the capital.

Sick and wounded sent back to Tank.

"The advance was further postponed by the arrival in the Camp of "a deputation of 11 Mahsood Chiefs, who were "received by the Commissioner, Major Taylor, "Brigadier General Chamberlain and Lieutenant- "Colonel Lumsden. Every exertion was used to persuade these Chiefs of "the advantages of peace, and to show them how anxious we were to "avoid further hostilities. They were informed that if the tribe was too "poor to make the necessary compensation for the cattle stolen during "the last eight years, the concession of a free passage for the force to, "Kaneegoram, with security for the future good conduct of the tribe "would be accepted as indemnity for the past. The Chiefs were further "assured that if these terms were accepted, neither their houses nor crops "should be injured; and after one day's halt at Kaneegoram the force "should return, either by the Bunnoo or Tânk route as most convenient.

Arrival of a deputation of the Mahsood Chiefs.

"The meeting, however broke up without any definite understanding "having been arrived at; the Chiefs returned to "their clans, and preparations were made for the "advance of the force.

Their return.

"It was evident that the Wuzeerees were determained to fight. "The force therefore march on the 2nd to Jhungee- "ke-kote, and on the 3rd reached Zerunaim, at "the southern entrance to the Awnai. The destruction of houses and "crops was renewed.

The forced marches.

"It now became apparent that the enemy had fixed on the Burrara
"Gorge, about 5 miles from camp, as the most
The Burrara Gorge.
"easy of defence, and that at this point they would
"oppose the further progress of the column. This gorge, is described
"by Brigadier General Chamberlain as the most difficult of any that was
"seen, whilst the Awnai gorge where resistance was first anticipated,
"proved to be the easiest, thus accounting for the non-appearance of the
"enemy at this latter point. From the Awnai gorge, the Brigadier Gen-
"eral thus describes the onward route to the capital. From the Awnai
"upwards the passage is considerably narrower than it is below it, and
"the hills on either side are steeper and higher. In short from this point
"upwards, the whole road is a defile until close to Kaneegoram, when
"the hills become lower and rounder in form.

"Soon after daylight on the 4th, the force moved forward, and after
"advancing 4 miles up the defile, entered a nar-
The advance of the force up the Defile.
"row cultivated dale, at the further end of
"which, and distant about a mile, was the Burrara-
"tunga. The heights on both sides were crowned by the enemy,
"estimated at from four to seven thousand.

"The Burrara-tunga is described as a narrow cleft cut by the Tânk-
"Zam, through a chain of mountains crossing
The Burrara-tunga described.
"its course at right angles. Both sides of this
"passage are perpendicular to a height of 40 or
"50 feet from which the mountains slope upwards at a considerable in-
"cline :—the southern face of the western hill being inaccessible to
"Infantry, but having a tower at the point where its eastern slope de-
"scends perpendicularly into the gorge itself, every commanding point
"was crossed by a breastwork, and the gorge itself closed by a wall of
"boulders and trees, equal to resist siege Artillery.

Columns of Attack.

* Right Columns advance, Wing of 3rd Punjab Infantry, 300 strong, under Lieut. Ruxton.

Support

2nd Punjab Infantry, 500 strong, under Lieut.-Colonel Green, C. B., Hazara Mountain Train, 4 pieces under Captain Butt.

Reserve.

Wing 1st Punjab Infantry, under Captain Keyes.

† Left Column advance, Wing 6th Punjab Infantry, 300 strong, under Lieut. Fisher.

Support.

Wing Guide Infantry, 250 strong, under Lt.-Colonel Lumsden, C. B., Peshawur Mountain Train, 4 pieces, under Captain DeBude.

Reserve.

Wing 6th Police Battalion, 300 men, under Lieutenant Orchard.

"The Columns of attack were
"formed; the right,* under Lt.-
"Green, C. B., the left† under
"Lieut.-Colonel Lumsden, C. B.,
"Four Field pieces and the wings
"of the 4th and 24th Punjab In-
"fantry formed the support about
"900 yards from the gorge, with
"a wing of Goorkhas and Cavalry
"a little in their rear as a reserve;
"the baggage being massed in
"rear, guarded by a detachment
"of the 14th Punjab Infantry
"and foot levies, with a wing of
"the 4th Sikh Infantry as rear
"guard.

"Lieutenant-Colonel Green's column met with considerable resis-

Lieut-Colonel Green's column.

" tance ; but after a difficult ascent, covered by " the fire of Captain Butt's mountain train guns, " and that of the field pieces below, the leading " men of the 3rd Punjab Infantry, headed by Lieutenant Ruxton, reach- " ed to within a short distance of the breastworks, but in too small " numbers and too broken to make the final rush. Here a check occur- " red, and the Wuzeerees, rushing from their breastwork drove the 3rd " back upon the support, which also gave way and the Wuzeerees conti- " nued their gallant attack upon the reserve and mountain guns. But " short was their triumph. Captains Keyes and Butt received them " like gallant soldiers, and drove them back, when breastwork after " breastwork was won; the casualties were 30 killed, including Lieute- " nant Aytoun, Her Majesty's 94th Regiment, attached to the 2nd Pun- " jab Infantry, and 84 wounded ;—the enemy leaving 35 dead bodies on " the ground.

The ridges cleared of the enemy.

" In the meantime, the fire of our guns being directed on their right, " the enemy were evidently giving way. Lieut.- " Colonel Lumsden was ordered to advance, " which he accomplished with excellent judg- " ment, and then ascending the eastern slope of the hill, cleared ridge " after ridge, with his mountain guns, at a loss of only two men.

No further opposition offered by the enemy.

" No further opposition was offered, and the camp was pitched on " the Bungeewalla Cucha, three miles beyond " the defile. The crops in the neighbourhood " were given over to the cattle, and the houses " set fire to. In the evening a deputation was received from the Mah- " sood Chiefs and from the Chiefs of Makeen suing for peace.

The force halts at Kaneegorum.

" On the 5th the force advanced, and after a march of 15 miles halt- " ed near Kaneegorum. Relying on the friend- " ly professions of the Chiefs, no injury was done " to crops and property.

Protection given to the Oormoor elders of Maidanee.

" At Maidanee, about four miles from Kaneegorum, the force was " met by the Syuds and Oormoor elders of the " place to whom assurances of protection were " given. It should be observed that no Wuzee- " rees reside in the town, which is only occupied " by the few remaining members of the Oormoor tribe, the original " occupiers of the country until dispossessed by the Mahsoods.

Attempt to ascertain the intentions of the Mahsood Chiefs.

" The force halted during the 6th, 7th, and 8th, and sent messengers " to ascertain the intention of the Mahsood " Chiefs. Most unsatisfactory answers were re- " ceived, and reports reached camp that they " were consulting where they could best oppose " the egress of the force.

" No further communication being made by the Chiefs, the troops

" moved back on the 9th, to Doatoga, 5½ miles,
The troops move back. " setting fire to everything that had been spared
" and protected on its upward march :—one ex-
" ception being made in favor of the property of the son of the Ahmed-
" zye Chief, Swahn Khan, famous for having, as far back as 1824, shown
" civility to the enterprising traveller Moorcroft, and subsequently to the
" British Officers engaged in the settlement of Bunnoo in 1847.

" On the 10th the force marched 5¾ miles towards Makeen, meeting
" with no opposition, save that attempts were
Attempts of the enemy to harass the rear guard. " made to harass the rear guard ; but, owing to the
" skilful arrangements of Lieutenant Colonel
" Wilde, C. B., commanding, only two men and one horse were wounded.
" All Mahsood property passed was destroyed.

" On the 11th, the force halted at Makeen, the residence of the
" Chiefs of the tribe, now deserted. In view to
Makeen destroyed. " save the town, every effort was again made to
" induce the tribe to listen to reason, but with-
" out effect. Makeen was therefore destroyed.

" Operations were now closed, and the force turned towards Bun-
" noo, the course by which it was originally in-
Operations are closed. " tended to return. As the column moved away
" on the 12th, two high towers which guard
" the eastern entrance of the valley, and had been occupied by our pic-
" kets, were blown up.

" The direction of the march was now changed towards the north ;
" 8¼ miles took the force to Ruzmuk, from which
Direction of march changed towads the north. " decends the Khissora defile leading to Bunnoo.
" Shortly after leaving Maheer the Mahsood
" boundary is passed, but before crossing it, their village of Toda-Cheena
" was given to the flames, and its crops destroyed.

" On passing the Mahsood boundary, the Ahmedzye lands were
" entered. Small parties of Mahsood horsemen
Entrance into the Ahmedzye lands. " still followed, and endeavoured to annoy the
" line of march from the hill sides, and this
" continued until the 15th, when the force reached Surehab, from which
" date no more was seen of them.

" On the 8th the Force marched to Speen Soonk, 10 miles clear of
Return of the Force to Bunnoo. " the defile, and within the British boundary,
" and two more short marches took it into Bunnoo.
" Although the expedition did not result in the submission of the Mah-
" soods, success was great. A considerable loss was
Great success of the expedition. " inflicted on the tribe. Whenever they met our
" troops, they were invariably defeated. Their
" chief town Kaneegorum was occupied, and spared only on payment of a
" fine ; whilst Makin, another principal town was destroyed ; and their
" hitherto unknown country surveyed and mapped."

The conduct of the Mahsoods has, it is belived, been very unsatisfactory ever since the expedition of 1860.

Amongstthe Mahsoods some of the Shahabi Khel Alizaes and Shingi, Jalal Khel Balolzaes have caused the greatest annoyance by their plundering habits. The Malik Shahis and Kukaris are not much better. The Alizaes are generally well disposed to the British, but the ties of kin and country are too strong to permit them to take a decided position against those evilly disposed. It is worthy of note that the Nawab of Tânk is connected by marriage with the Manzar, Alizaes. The Mahsoods bear no good will to the other two great tribes, Ahmadzaes and Utmanzaes, as they attribute much of the success of General Chamberlain's expedition of 1860 to the information given by the Ahmadzaes to our officers. Several skirmishes take place between them annually in which lives are often lost on either side.

In 1865 a council was held, by which an arrangement was come to. else it is said, the Ahmadzaes and Utmanzaes would have united their force 20,000 in number and attacked the Mahsoods in their own country.

The Gurbaz number 1,500, and reside on the borders of Khost, to the Afghan Governor of which they pay a small tribute. The British Government has never come into contact with them. A small number live in the Tochi pass and form escorts for Kafilas to Dawar and Khost.

The Leila number 1,500 and reside on the (northern) slopes of the Sufed Koh. The British Government has never come into contact with them.

The grand total of the fighting strength of the Vaziris is :—

Utmanzaes	17,200
Ahmadzaes	9,280
Mahsuds	14,500
Gurbaz	1,500
Leila	1,500
Total	43,980

The unity of the Vaziris is proverbial, yet in the three "razias" we have made into their country, we have found that they will not support each other ; in each case the section which had come under our displeasure was left to fight it out by themselves.

Nevertheless that they have a character for union is undoubted, and James, writing curiously enough after both the Umarzae and Kabal Khel expeditions, still alludes to his belief in it.

This marked characteristic of the tribe, he says, is fostered by peculiar customs and law. It is well known that, amongst Pathans the avenger of blood is not only privileged but bound to slay any relative of the man who had committed the deed, for which vengeance is sought. But Vaziri greyheads of ancient times ruled otherwise, with them the actual murderer

must be the only victim. The effect of this wise law is to cement the tribe by avoiding those ramified feuds which in other places arise out of indiscriminate vengeance, where an account current of blood is handed down father to son to be balanced at convenience, and where the friend of yesterday becomes the victim of to-day. Again the sums of money which under certain circumstances are accepted by relatives of the slain, locally denominated "make up" money, are fixed at much higher rates than amongst other tribes. Vaziri life therefore is habitually regarded as something valuable. The sums are so large indeed as to be seldom forthcoming, when articles of property are reckoned on at fancy prices, but still the nominal mulct has restraining influence on those passions which would lead to strife and disruption.

Maclean says, that there is no pretence of union between the Darvesh Khel and the Mahsuds , the former call themselves Vaziris, and the latter Mahsuds; regarding them as wild beasts; but there is so far union among these, that though Darvesh Khel or Mahsud may not take up the quarrels of their brethren, they generally will not give information against them.

The Vaziris boast that they have no poor man amongst them. Whenever a family is brought low by deaths, accidents or raids, from without, the clan subscribes to re-establish it, one bringing a bullock, another a camel, a blanket and so on. Thus there is no incentive to the Vaziris to leave his home to seek a subsistence, or to enter foreign service, and therefore very few if any are to be found in the ranks of our Army.

The Northern Vaziris have very few regular villages, and these are on the banks of the rivers, protected by walls of loose stones and towers ; within the hills they reside in "Kizdhees" or encampments, constructed of stout black woollen blankets spread over curved sticks with sides of coarse matting. These blankets are worth from 10 to 30 rupees, and are exceedingly impervious to rain, and not easily destroyed by fire. The cattle and sheep are kept in the encampment which is guarded by dogs of a large breed and singular ferocity. The only permanent traces of the Vaziris are found in the graveyard of their tribes, which are scattered over the hills at convenient spots. The tombs are of loose stones, put together with much care and neatness. These resting places of their dead appear to be the exclusive objects of veneration to the Vaziris, and in them are deposited their household stuff, when absent from their camps, the boldest thief not daring to lay sacreligious hands on it.

The Vaziris are much under the influence of their spiritual adviser, Kazi Nazibula of Biland Khel and also of the Syads of Urmur. The Vaziris, physically, are tall muscular highlanders, and they are universally credited with considerable courage. Their successful forays have given them a great stock of camel, sheep and cows, which enable them to add meat and bread to their food. The Vaziris are at war with all their neighbours, and on every side except towards the British frontier they have made conquests. From the Karotis they have taken Bermul. The Jadrans are confined to one ridge, and the whole country of Zhob and Ghwalari Pass tremble at their very name. They are de-

clared by their enemies the Lohanis to be Shiahs, but this is a calumny. It is also said that they are descended from some few Hazaras, who fled before Nadir Shah and to have increased in these mountains, but this is not true as they speak "Pukhtu."

The Vaziris generally go on foot and are most active in the mountains. A few great men of the tribe have horses but are bad riders. They generally attack caravans by night but sometimes by day. A Vaziri is never spared when caught by any one of the surrounding tribes, their enemies. The Vaziris never injure females or take their jewels, but all males they invariably kill. Even by their enemies the Vaziris are allowed to be very hospitable: a man who has killed the brother of another need only go to his house to be treated as an honored guest, and a little girl would serve for escort thro' the whole country. They stick closely to each other, and their neighbours constantly allow that they are famous for speaking truth and for their courage, but with all this they are habitual robbers and murderers.

These statements however must be taken "cum grano," or in a comparative sense. They show the opinion which is held of them comparatively by their neighhours, for, as Lumsden says, of the Afghans, Vaziri honor and Vaziri hospitability when judged by a civilized standard, would surely seem infinitessimal in quantity and indifferent in quality.

Taylor has a high opinion of the Vaziris, and agrees in the main features of Elphinstone's eulogium. They are united amongst themselves and truthful, though haughty and blood-thirsty to strangers. Take them all in all they are a fine race of men, prone to plunder and careless about blood-shedding it may be, but bold, plain-spoken, true to their friends and not usually treacherons in their mode of prosecuting hostility to their enemies. When a Vaziri lets blood there is generally either some semi-political object or private revenge at the bottom of it, and they do not usually murder strangers. There is no denying they are inclined to be boastful and rough in council.

In religion the Vaziris are Suni Mahomedans, and all belong to the Samil faction of politics. Among their peculiar customs, in which they differ from other Afghans, is in case of adultery when instead of killing both parties they kill the woman but only cut the nose off the man.

The Vaziris neither own now, nor by their own account have owned, any allegiance to any of the Kings of Kabul. If you ask them where their country is, they point to the far off horizon where the azure sky is pierced by the snowy peaks of the Sufed Koh, which they call Spingurh. But that great range is only their citadel at the head of a long line of fastnesses, extending from their frontier of Tank, less than 100 miles Dera Ishmail, and to within 50 miles of Jelalabad.

The proper settlements of the Vaziris are amongst the higher spurs of the Suliman range where they pass the summer months. In October the greater portion of the tribe descends, with flocks and herds to the

lower hills bordering on the Kohat and Banu districts. Some of the clans who are located on the lower slopes of the Suliman mountain remain there throughout the year or only partially remove.

The Vaziri country is said to have wood and water and grass in plenty ; some valleys are partially cultivated with rice, joar, wheat and barley. The rice crop proves there is plenty of water.

The Mahsud country is intersected in all directions by ravines, generally flanked throughout their course by high hills, which occasionally recede sufficiently to give the space enclosed the appearance of small valleys. The width of these ravines is very variable, in some places being as much 1,000 yards, whilst at other, they narrow to 100 yards or less ; but as may be supposed they are broadest at their mouths and gradually narrow as they ascend. The narrowest parts are where the water has had to pierce its way through a range crossing its course at right angles. Such gorges, called by the natives " tungas," are the points usually occupied by them to oppose an enemy. On both sides at intervals throughout their course patches of land have been deposited and are preserved by artificial means for the purpose of cultivation ; and the largest of these afford some space for the encampment of troops. The beds of the ravines are paved throughout with boulders and stones.

In fine weather a stream of water usually trickles down them, requiring to be crossed every few hundred yards, but after rain these beds suddenly fill and often become dangerous torrents. Such channels and their tributaries form the ordinary means of communication within this country.

From the rugged nature of the country (says Chamberlain of the Mahsud), cultivation is confined to the plateaux at the base of the high mountains, the small valleys and to the plots of land bordering the main ravines ; these latter are termed by the natives " Kachis" and they are a feature in all the principal defiles of the Suliman range. In the valleys and " Cuchee" the land is generally terraced and irrigated, and in many instances the water is led into the fields by means of channels cut out of the hill side, exhibiting considerable engineering skill and great labour. The borders of the fields are commonly planted with mulberry and willow, which give to these spots a pleasing appearance compared to the rugged hills which encircle them. The Mahsuds live in houses and these are ordinarlly perched upon the hill side above their cultivation, not together in any order, but apparently for convenience of families.

On both banks of the Kuram are broad tracts of rich soil, cultivated by the northern Vaziris, and also on the banks of the Keti River, which rising in the Khost falls into the Kuram near Zerwahm. The produce of the lands is the great source of wealth to them. Beyond these streams they have no cultivation, but the hills afford abundance of rich pasture for their flocks, and the ravines are mostly lined with excellent grazing for their numerous camels. The general character of the hills on the right bank of the Kureem is not so difficult as their jagged

outline would indicate. They are but rough walls, which support extensive tracts of table land or conceal the grassy slopes within. There are few places impracticable for horsemen. The great apparent want is water; springs are rarely met with and these are not copious ; at some of their encampments it has to be brought from a distance of several miles.

The Viziri hills to the east of the Kuram are much more difficult than those on the west; they are massed together, huge cliffs meet the eye in every direction and the inaccessible peaks of the higher mountains assume the appearance of gigantic castles.

The outer spurs of the Vaziri hills are quite bare of verdure and almost of soil, but as they recede from the plains, they become covered with olive, oak and lastly pine. In some parts at Maidni and Razmak the hills lose their steep character, and assume the appearence of downs covered with turf and wild flowers. None of the trees met with in Vaziristan are of any size and in strictness can only be called sub-arboreous, and this to the hightest point (8,000 feet) reached by General Chamberlain. Above 9,000 feet, pines begin.

This fact of the absence of large trees depends in part on the aridity of this tract of country, and in part to the great scarcity of soil on most of it.

Iron ore is found in the Vaziri hills and yields a metal which is highly prized by the natives. The principal site is in the hill called Koh-i-Mahsud near Makin and Bobar, where the metal is found in a slightly lustrous ore, it is dug out and crushed. Perhaps Rs. 10,000 worth is sold annually and exported to British territories.

The inhabitants of Shekh Edli make vessels and plates of the iron which are exported to Ghazni by the Permulis. Every village and hamlet has its smelting furnace constructed with a conical roof of long poles planted nearly vertically in the ground. The ore is poor and scanty and the iron extracted from it is said to derive its value chiefly from being smelted with charcoal.

The Vaziris have a very fine breed of horses which are exceedingly hard and active, though small and often impetuous and vicious animals. They are difficult to procure in any great numbers, as the demand for them is great and they are numerically scarce. It is said that they have Arab blood in them derived from horses in Nadar Shah's Army, which were either given by or stolen from that conqueror. They appear to consist of two breeds: one called Khazarwal, from one Khazar who introduced them, the other Duglagala or thieves brood, from the parent having been stolen. However serviceable for ordinary purposes the Vaziri horse is not adapted for Cavalry, seldom exceeding 14 hands.

There are only two towns in the Mahsud country, Kanigorum and Makin. No Vaziris reside in the first, but all the tribe meetings are held there, and whilst the council is assembled, the inhabitants have to provide the members with board and lodging free of expense. Each clan having its established billet. With the exceptions of a few artizans residing at

am no others are to be found in the Mahsud country. Their nship is strong but coarse, and the most valued arms are imported from Afghanistan or India.

Such trade as there is in the country is carried on by the Urmur tribe who owned the country till dispossessed by the Mahsuds.

N. B.—The accounts are not entered in the last part of this paper, because sufficient were not available.

This account of the Vaziris is compiled from the following sources: Edwardes, A Year &c. James' Letter on Kabul Khel Expedition; Chamberlain's ditto; Chamberlain's Mahsood Vaziri Despatch: Lumsden's Kandahar Mission; Notes on Vaziris by Colonel Coxe; Punjab Reports from 1849; Walker's Trans Indus Frontier; Stewart's Notes on Vuziristan; Reynell Taylor's Memo on Dera Ismail Khan; Urmston's Notes on Bunnoo; Thorburn's Report of Bunnoo; Notes by Coke, Honigberger, Broadfoot, Elphinstone, Aga Abbas, &c. &c., and Captain MacLean on the Vaziris.

C. M. MACGREGOR, *Lt.-Colonel.*

think, if they had once elected and proclaimed me their Sovereign, they would have deserted me and left me here. But, however that might have been, Germany will sooner or later acquire her unity. The impulse towards it already exists; and I doubt if, after my fall and the termination of my policy, any other system is possible in Europe than the agglomeration and confederation of great nations."

It is an interesting question how far the maxims on the art of war of this great man are applicable at the present time. It may safely be asserted that the general principles of strategic science laid down by him are as true now as ever they were; and Von Moltke has declared that the art of war changed more decidedly during the period between Frederick the Great and Napoleon than between Waterloo and Sadowa. It should be the object of a General now, as in the days of Jena and Austerlitz, to understand perfectly the theatre of war, to have a well-laid and matured plan, to operate on the decisive points, to assail the enemy where he is most vulnerable, to have his army always prepared, to avoid being defeated in detail, to combine turning movements with direct attacks, to reach, if possible, the flank and communications of his adversary without exposing his own to danger. But, as Jomini remarked some years ago, and as recent experience has proved, the modes of attaining some of these ends have been to a certain extent modified, and a few of Napoleon's subordinate rules and illustrations of military combinations require to be in part qualified. Thus, as we have said, operations by distinct armies, on separate lines, are less likely to be objectionable, and will be more commonly undertaken than they would have been forty years ago; and Napoleon's system of interior lines, as the same great critic has pointed out when commenting on the campaign of 1813, will probably produce less striking results with the immense armies of the present day than it did in the campaigns of 1796 and 1814. With respect to tactics, the dense formations, the heavy masses, and the manœuvres which rather aimed at effect than at strength of fire and real charges—these characteristics of the French Revolutionary wars, adopted afterwards by Napoleon, have become in a great measure obsolete; but this is rather a recurrence to sound principles than a revolution altogether new. The great improvements effected in modern small-arms and artillery science have increased the difficulty of forming an order of battle, have separated by a wider distance the fronts of armies about to engage, have multiplied the responsibilities of the Commander-in-Chief, have caused formations to be less deep, have made skirmishing of greater importance, have compelled troops in attack and defence to have more than ever recourse to cover, have certainly lessened the power of cavalry as an offensive arm against unbroken infantry, and, speaking generally, have augmented the value of intelligence and skill in the individual soldier; but it is a mistake to suppose that all this has made the art of war essentially different from what it was in the days when Napoleon proved himself a master of it.

IV.

The Tactics of Prussian Intantry.*

Captain Robinson has done well to obtain the sanction of the Duke of Wurtemberg and give his pamphlet, on the system of attack by the Prussian infantry during the late war, a better circulation in England than it could have so long as it remained in the original language. It would be difficult for any officer desirous of improvement to read this little book, comparing it as he goes with the "Tactical Retrospect," without finding himself with feet firmly planted on a new platform. The author of the "Tactical Retrospect" undertook to criticize Prussian tactics even after the success of 1866. He praised the infantry, but showed how there were certain dangers in the system of the Prussian army, only to be met by some modification of their method of attack, and especially by better assistance from the cavalry and artillery. All the world saw the marked improvement shown by these two arms in 1870-71, but only the few understood that the advice to the infantry given by Captain May was found to be most valuable, and was, after Sedan, actually adopted with success and economy of life. He showed how the tendency had always been during the war to dissolve battalions into companies and companies into skirmishers or mixed groups, and, instead of trying to hinder this by stricter rules or closer formations, he recognized that herein was to be seen the natural development of tactics since the breech-loading rifle was put into the hands of intelligent soldiers. He said, therefore, "Let us adapt our drill to the circumstances, and arrange so that the dissolution which is inevitable may be foreseen, and so ordered as to be a regular system, while the men, when scattered, may know that they are well supported, and that all is going well." In the late Autumn Manœuvres it was remarked that skirmishers failed to push the attack, and even retired with unreasonable precipitation, while lines faced each other at 200 or 300 yards and fired at such a rate that both sides must have been exterminated, unless one or two lucky men happened to survive. This was because the infantry soldier is accustomed to consider himself safe in line, but in danger when skirmishing. We hold that the reverse is the case, and that the line formation is not suitable to the requirements of tactics since breech-loaders came into use. The objection is, that it cannot adapt itself to circumstances. The experience of 1866 taught the Austrians that heavy columns suffered horribly

* *The System of Attack of the Prussian Infantry in the Campaign of* 1870-71. By Lieutenant Field-Marshal William, Duke of Wurtemberg. Translated from the German by C. W. Robinson, Captain, Rifle Brigade, Garrison Instructor. Aldershott. Mitchell and Co. 1871.

from the fire of breech-loaders. The column which attacked Chlum, after the village had fallen into the enemy's hands, lost about half its numbers in a short time, together with 23 guns. The result of Austrian experience was the adoption of the Prussian division of battalions into four companies, and a further development of a regulated attack in loose order. According to the Duke of Wurtemberg this is exactly what the Prussians came to in the midst of their last campaign, though they began otherwise. Before giving the substance of the pamphlet, it may be worth while to explain that it was first delivered in the form of a lecture to officers at Prague, and afterwards published in the Journal of the Vienna Military Scientific Society. In the present condition of Europe military progress is one of the first necessities, and, while the breech-loader and the rifled field piece demand some modification of the old formations and tactics, it would be rash to make changes until the subject has been freely discussed. All the great military countries teem with books, pamphlets, and newspaper articles on modern war. Prince Frederick Charles set the example in the *Brochure*—published anonymously—which is popularly known under the title *How to beat the French*, though that was not its original name. Since then such men as Von Moltke, the Duc de Chartres, the Archduke Albert, and a host of writers of lesser rank, have given the world their ideas in print, generally withholding their names. A collection of the best among these essays translated into English would be of great value, and we commend the subject to the notice of such men as Colonel Ouvry and Captain Robinson.

The Duke of Wurtemberg begins by telling how the first news of the war was that the Bavarians had taken Wissembourg at the point of the bayonet, and the Prussians had stormed the Geisberg at the first rush. Then followed more accounts of positions stormed and the success of bayonet attacks, until Austrians and Russians of the old school, to say nothing of Englishmen, raised their heads and rejoiced at the hopeful revival of old systems of tactics. The disciples of the new school shook their heads and watched carefully for more light to be thrown on the details of the various actions. Soon appeared the fact that no successes had been attained without flank attacks, and even then the list of killed and wounded was observed to be terrible. At first no accounts appeared from the pens of competent military men.

It was not till comparatively late in the war that critical descriptions of battles and skirmishes were seen in print, but from that moment no more was heard of attacks on positions by heavy columns, for the columns were always said to have melted into swarms of skirmishers. The way was prepared by heavy artillery fire, the skirmishers spread, pushed forward, gathered in groups for rushes now and then; a few men broke through the enemy's line somewhere, the rest flocked to the spot or supported the attack by demonstrations on the flank; the enemy yielded, and the Germans rushed on with mighty cheers. Such were the invariable accounts given by officers as soon as officers

were there to give them. As soon as the war was over, the Duke of Wurtemberg hastened to visit the scenes of the campaign, and set himself to reconcile the conflicting accounts. The result of his studies is before us.

The superiority of the Chassepot to the needlegun was neutralized, or nearly so, by the want of capacity for taking trouble so inherent in Frenchmen. Taught to trust in their weapons to keep the enemy at a distance, they neglected accuracy of aim. As a rule, the infantry soldiers elevated the muzzles of their rifles at high angles, seldom even putting the butts against their shoulders. Though the firing was wild, it had the advantage of enabling the men to keep well under cover, and caused the Germans to feel the storm of bullets at distances of 1,200 to 1,800 paces. But the result was that the attacking infantry were encouraged to press near so as to be out of the dangerous zone of fire, and ammunition was wasted.

Again, the French held the great and universal principle that the defensive must always remain without result and soon lose its efficacy, unless the defenders are ready to assume the offensive at the right moment. "But here, also," says the Duke, "that superficiality and lack of reflection which is clearly inherent in the Latin people again showed itself. They continued to act according to regulation, or to this or that order, without inquiring why the attempted offensive efforts remained continually unsuccessful."

They took, indeed, the offensive, but only by direct and massive attack in front. With daring courage, great activity, and unparalleled *élan*, densely massed groups, starting from behind their cover, threw themselves on the enemy, interfering by their forward rush with their own riflemen, and soon came under the "schnell fire," or volleys of the standing or halted infantry; they were then forced, with fearful loss, to retire again behind their cover. Flanking movements—offensive efforts of small bodies by fits and starts, which, under the protection of fire delivered from good cover gradually rally and accumulate, in order to attempt the assault in the closest vicinity—were manœuvres which were very seldom resorted to by the French. In other words, the French had adhered too long to an obsolete system of tactics. The answer of the Generals to all who impressed upon them the necessity for definitely planned manœuvres to meet the breechloader was, "Our men have a natural aptitude for war, and will do the right thing on the spur of the moment." When the moment came their hearts were too full and their heads too empty to devise new plans. The moment passed by, and they retreated from the ground covered with their slain.

The Prussian method of attack as prescribed in their regulations was that of half battalions. Two companies, nominally 500 men, advance with their skirmishers extended, and fight as well as they can, while the other two companies follow as a reserve or support. But the Chassepot reached beyond the first half battalion, creating havoc in the supports, which, not inclined to retire, pressed forward abreast of their

comrades. The battle then came to depend on the company leaders, and their excellent training, together with the marvellous independent action of the skirmishers, led to brilliant results.

The storming of the Geisberg at Wissembourg was effected by a continuous forward rallying of small extended bodies, behind the frequent but insignificant shelter presented by the folds of the ground or by dead angles; of advances by fits and starts of troops in extended order close to those which had collected together again. As these separate bodies approached the top of the hill they came together of necessity, were then close to the enemy, and made the dash which carried them over the last few paces into the enemy's position, already weakened by the fire of artillery, and placed in jeopardy by the flank attack of the 11th Corps. Again, at Wörth the same tactics prevailed.

The advance of the Germans was preceded and supported by heavy artillery fire, and succeeded because the skirmishers knew how to take advantage of every little bit of cover. The enemy was astonished at the obstinate and indomitable advance of these men, and was shaken and half defeated before the final rush came.

At Gravelotte the storming of St. Privat by the Guards was the nearest approach to attack in deep columns that occurred during the war, and it failed. Eighty-four guns had cannonaded the French position with great effect at from more than 2,000 to 4,600 yards. Three brigades of the Guards then marched to the attack in two lines of columns. The front of attack was about 2,000 paces, so there were about ten men to every pace of frontage. In about ten minutes 6,000 men fell—three men to every pace of frontage—under the murderours fire of mitrailleuses and Chassepots. Heroes as they were, the Guards had to retire without reaching the position, or even nearly approaching it. The Commander of the Guard called back his men only in time to save them from total destruction. It is sometimes asserted that the Prussians have never been tried by defeat. Nothing could be more incorrect than this statement. They have often been tried by temporary defeat, and the value of their training has shown itself in the readiness with which they re-assembled in such order that their second attack, better prepared, was successful. The attack on St. Privat was an instance. The Guards were ready an hour and-a-quarter afterwads, when the Saxons had gained the flank of the enemy, to renew their attack in conjunction with the 9th Corps.

After Gravelotte, says the Duke of Wurtemberg, "The attack in line of columns over open ground was marked out as an impossibility and a useless loss of men, and definitely rejected."

Here we would pause an instant to remark that the fire of the French against the Guards was found to be terrible even at 1,500 paces. There was no overlapping the head of a single attacking column by the defenders. Stiff lines advancing in two ranks would probably have suffered as much as the columns did, or nearly so, for it must be remembered that the French fire was not accurate. Is there a man bold enough to assert that lines of men could have advanced without

breaking over ground so defended? A broken line is the hardest of all formations to put together again under an enemy's fire. If the head of a column melts, the men naturally seek shelter behind their comrades. A line is all front. We shall presently come to the system by which the advantages of the line are retained with more than the mobility of the columns.

First, we must follow the Duke of Wurtemberg in his description of the general features assumed by a Prussian attack, whatever the details or formation of the infantry might be. The author shall speak for himself:—

"The predilection of the Prussians for the concentric form of attack is well-known, and the results obtained by their skilful execution of it justify this. Even out of a paralled advance, a concentric attack usually resulted, because the Prusso-German troops always march on a very broad front, more than a division of the army being seldom placed on one road, and because the ordinary form of their offensive, carried out under all circumstances, framed itself as follows:—

"As soon as the advanced guard struck upon the enemy it laid hold of him and entered upon an earnest struggle of some duration. The artillery was immediately pushed forward in as great strength as possible, and played on the enemy's front from the nearest positions, often at from 1,400 to 1,600 paces, while the infantry was at once directed against one flank of the position (or, if the position was very contracted, against both flanks), in order to surround it. Only a proportionately small force of the infantry was held back as a reserve. All troops coming up afterwards were either, as they approached, directed against the flank (or both flanks) or pushed behind the fighting troops towards the flanks, on which occasions a relief of the reserve was sometimes effected."

The author compares this form of attack to the action of a pair of tongs, and gives an elaborate description of the Battle of Saarbrucken as an example, showing that out of the many attacks made on that day only one, which had been previously prepared by a flanking movement, was successful. After a careful study of the battle, the Duke says, that the fighting of the first period of the campaign "yielded incontestable proof that the attack in line of columns on open ground was a useless waste of men."

Is, then, every position with open ground in front of it unassailable? By no means. The result of Prussian experience was put in practice at the attack of Le Bourget on the 30th of October, 1870, and adopted in principle throughout the rest of the war.

"Le Bourget is a village of some length, the gardens of which are surrounded by long, straight walls, six feet in height, intersecting each other at right-angles. These were prepared for defence by loop-holing and heaping up earth, and the entrance to the village was barricaded. The attack was undertaken from three sides—*viz.*, from Blanc-Mesnil, Dugny, and along the road between them. The two flanking columns sent to the front clouds of skirmishers, which gained

ground at the double, and then threw themselves down. The supports and reserves followed these, spread out in extended order, and also at the double. As these latter threw themselves down to rest, the skirmishers again ran forward, and at the same time bore off towards the flanks. When they arrived within range they again threw themselves down, and opened fire upon the enemy. The gaps which occurred from drawing off towards the flanks were filled up by extending sub-divisions. In like manner the flanks were prolonged by single companies advancing one after the other, but always in extended order, so that the concentric attack, which had, moreover, as the enemy was approached, become denser in character, kept always assuming a more enclosing form. Each of the extended bodies of troops took advantage of whatever cover offered, in order to rally behind it and collect together. Thus, in front of the north-east flank, a row of dung heaps had been left upon the field, which afforded a rallying place for an entire company, which opened from behind these a destructive fire upon troops who came forward to attack. On the other flank, the bed of the brook Le Moleret afforded a slight protection, and was at once turned to account by a few formed companies, in order to cover an onset against a counter attack delivered from Drancy.

"The mechanism of the attack consisted principally in the rapid change from open to close order directly the most trifling cover admitted of the rallying of a sub-division or company. On the other hand, every advance over open ground took place in widely extended skirmishing lines, which moved on like ants.

"The right wing was left behind, the centre had not sufficiently extended itself, and had renounced old forms too little, and its losses were enormous; but the attacking left wing, under Lieutenant-Colonel Graf Waldersee, pressing forward in long thin lines, succeeded in making good an attack of skirmishers up to the garden walls, in silencing the fire from them, and in breaking into the long village both from its flanks and rear. Its defenders now gave way, General Budritzky was able to enter from the front, and the right flank column to reach the rear entrance without very severe loss."

From that time forward the attack in open order, combined with the attack of skirmishers, was adopted as the only efficacious one; and it was strictly forbidden to lead bodies of troops, in close order, within a nearer distance of the enemy than 2,000 paces. Even on close intersected ground the same tactics were found to succeed. Columns were brought up under cover to within 2,000 paces of the enemy. The work was then done by fighting in a loose order, understood thoroughly and properly directed by the company leaders. In making use of the natural features of a country, especially woods, the Prussians have shown themselves hitherto unrivalled. Once, in the great battle before Le Mans, two battalions of Jägers attacked in skirmishing order by night; without firing or even loading, they succeeded in surprising an important position, taking many prisoners. In old instructional books on tactics it is laid down that

for the proper occupation of a position there should be 2,000 men or thereabouts to an English mile of front. The French adhered to this principle, forgetting that the wide range of rifle guns and the quick fire of far-reaching small arms cover now much larger spaces of ground than the old weapons used to do. The more men are crowded together the greater is the effect of artillery force upon them, and it searches out not only the front line but the second line and even the reserves. The Author gives as instances of this fault, the battles of Sedan, Mars-la-Tour, Gravelotte, &c. He says, that if the Prussian Artillery appears to have been so conspicuously superior, the French tactics are alone to blame for offering such excellent living targets. "In moments of anxiety," he says, "the snail, it is true, shrinks into its house, and the tortoise into its coat of mail; but for that reason neither tortoise nor snails will ever dictate laws to the world."

The action of the Prussians was exactly the reverse of this. When acting on the defensive they occupied the objective points with a very small force, and were therefore able to dispose of very powerful bodies for the purpose of wide reaching offence. They almost always succeeded in out-flanking the enemy while holding their front against all direct attacks, even when the French were considerably superior to them in numbers. In the battle of Saarbrücken, at the time when the greatest number of men were engaged, the proportion of men was about five to each pace of frontage. At Metz, on the 16th of August, the enemy were double their own numbers, yet they held their own with six men to the pace. They were more crowded on the 18th of August, because the French right was too far off to be quickly reached. On the 23rd of December, in the action at Querrieux, near Amiens, Manteuffel attacked Faidherbe in a strong position, having his men so extended that hardly two could be counted to the pace. When Prince Frederick Charles and the Grand Duke of Mecklenburg concentrated their forces upon Orleans, there were at the beginning of the action only two men to the pace. When they closed upon the French at the end of the day they had less than five men to the pace. At Le Mans, on the 11th of January, 1871, the Third Corps had only two men to the pace against enormously superior numbers. The whole army of Prince Frederick Charles on that day had but five men to two paces, though the Tenth Corps did not entirely deploy. Finally, at St. Quentin, on the 19th of January, there were at the close of the day only three men to two paces.

Having shown that the Duke of Würtemberg does not argue without solid facts and strong reason on his side, it only remains to sum up his conclusions. He is decidedly of opinion that the attack with musketry fire must supersede the attack with the bayonet. He believes that decisive results are only to be expected from the offensive, and that the defensive when necessary must be regarded merely as a preparation for the offensive. A direct offensive effort against well-handled breech-loaders is ineffectual, while the Prussian mode of attack described above, with offensive musketry fire employed by men in extended

order will soon assert its superiority over the defensive. "This offensive fire action" was impossible with the muzzle-loaders. It requires much patient training, both of officers and men, but it cultivates courage, intelligence, self-reliance, and well-disciplined obedience. But, before it can be practised with any hope of good results, the individual soldier must be trained to personal independence and confidence in his own skill, and must at the same time have thorough trust in the leadership of his officers, for, in the words of the author:

"It is in this that true discipline consists, not in a blind, passive, reluctant obedience, which, being void of confidence, ceases at the decisive movement when it is most essential."

The Prussian mode of fighting which has now been described by Lieutenant Field-Marshal the Duke of Wurtemberg was pointed out in letters to this paper by "A Military Correspondent with the Army of Prince Frederick Charles" during the battles before Le Mans. Since then a sense of the wisdom of it has been growing in the minds of our best and most thoughtful officers. The boast of our infantry and of the Great Duke during the Peninsular War used to be that the English could stand and fight two deep, feeling secure in their own courage without needing a column behind to push them on. The Prussians have now shown that they can both stand and advance fighting without even having comrades on each side of them. It is quite certain that what the Prussians can do the English can do. The Austrians have already adopted this fighting in extended order, and we are persuaded that the adoption of the system for the English army is only a question of time. We may alter the details, if we will; the principle is secure.

GLEANINGS.

I

The Sea Forts at Spithead.

THE iron framework of one of the principal forts for the defence of Spithead has been finished, and will soon be seen in its allotted place. The structure is unique, and merits description as a wonderful piece of mechanical and engineering achievement. Apart from that, it claims attention from the extreme importance of the subject, considering both the purpose of the work and the outlay of public money which it involves. When erected, it will give the world a visible sign of the magnitude of the undertaking which the War Department has on hand —a proof that something unprecedented in size and strength is being realized. After all the time, and thought, and talk, and money bestowed upon the idea, the country may have at last the gratification of seeing one of the vital points of national defence rendered as safe, to all appearance, as fortifications can make it. In pursuance of this object many of the plans of the last dozen years have had to be reconsidered and amended—many things done and undone, or begun and abandoned. The advance in the power of artillery during that period would alone have altered much that seemed good in the eyes of the Royal Commission of 1859. Nevertheless, the system of defences at Spithead may be looked upon as a fruit of the recommendations of that Commission. Its appointment was due to the strong feeling of insecurity which then prevailed. Looking at the unprotected state of the naval arsenals, and the supposed risk of our naval power being crippled, the Commissioners were instructed to report especially upon the means of making them secure. The protection of Portsmouth against an attacking fleet naturally formed a leading point in the inquiry. The Commissioners recommended the construction of powerful casemated sea forts at Spithead, and the most important of these works have been proceeded with, Parliament having sanctioned them. There are four sea forts to be named in a prefatory survey of the system of works, including one of which we shall give particulars, and which might be termed the most important, were it not that one of the others will be in every respect its exact counterpart.

It must be borne in mind that the object of these defensive works is, even locally considered, a very comprehensive one. It comprises not only the protection of Portsmouth, its harbour and dockyard, from bombardment, but also the defence of the extensive anchorage of Spithead, from the mouth of the harbour to the Isle of Wight. A glance at the map is, therefore, recommended to any reader who has not the geography of the situation well in mind. It will be seen then how obviously the approach may be commanded by two immense sea forts, one

to the north of Ryde Sands, in the Isle of Wight, and the other to the south of Southsea—the island, or, as it may be considered, peninsula of the main land, which forms the eastern side of Portsmouth Harbour, and on which Portsmouth itself is built. As a matter of fact the two principal forts will occupy these positions. One of the two will rise out of the water about 2,000 yards from Ryde Sands, being erected on the shoal called No Man's Land. Its consort will be erected on the Horse Sand Shoal, about 3,500 yards from Southsea. These two forts will not be much more than 2,000 yards apart, as any map must serve to show with the aid of the distances already stated. It then becomes important to note that the only deep channel passes through the space of 2,000 yards. The main approach to Portsmouth Harbour is from the eastward, by this same channel; and the forts on both sides must completly command it. Their guns would probably pierce 12 inches of armour at 2,000 yards' distance. It would seem, if one looked at nothing but these bare figures of range and distance, that the forts would not only be mutual supports, but might some day fire into one another. The reader will assume, however, that it is provided otherwise —that some thing more than the interval of 2,000 yards will always prevent such an occurrence. It is believed that the range of their projectiles would avail to keep an enemy's fleet outside bombarding distances of the harbour, and render it impossible for any fleet to remain at Spithead under their fire, or for any vessel to attempt to pass between them. The two forts remaining to be mentioned are the Spitbank and St. Helen's. The site of the former is the extremity of Spitbank Sand, about 1,200 yards from the northern shore (at Southsea Castle), and 2,500 yards from land to the westward of the entrance to Portsmouth Harbour. The St. Helen's Fort is located on a point of sand off St. Helen's, near the eastern extremity of the Isle of Wight. While the two first-named forts, as has been shown, protect the main approach, the St. Helen's Fort will cover the St. Helen's roads and the channels outside, and the Spitbank Fort will command the anchorage of Spithead, as well as the channel leading into the harbour. Of the strength and armament of all these forts we shall have more to say. Meantime, it should be noted that the system of defence is supplemented by land batteries at Southsea, to the eastward of the entrance to the Portsmouth Harbour; also at Gillicker, to the westward. These batteries would act in conjunction with the sea forts. On the other side, the approaches from the westward along the north of the Isle of Wight, are guarded by powerful batteries at the Needles and Hurst Castle, besides other works.

As regards the character of the sea-works we are indebted to the courtesy of the Fairbairn Engineering Company, the constructors of the iron framework of the two principal forts, for precise information. By the term framework the reader must understand the skeleton state and form of the forts, as distinguished from the armour with which they will be clothed hereafter, and the armament which they are intended to

carry. One of these structures is quite complete, and the first thing to notice about it is its extraordinary size. It covers a circle the diameter of which is 200 feet. The foundation prepared for it rises out of the sea to about 16 feet above high-water mark. From this platform the iron wall of the fort will ascend to a uniform height of 26 feet, and above this there will be a bomb-proof roof. When all is done, the vertical side, or wall, will present a blank face all round, varied by no features whatever save the noses of the guns, except at the entrance port, where the gun will be omitted. The holes for the guns to peep through will be the only openings (with that exception), each perhaps 4ft. by 3ft. All the rest of the wall—the whole exterior of the fort—will be dead armour plate, with the roof to crown it. This will be the ultimate aspect of the work, but in its present condition we have to deal with a comparatively open-looking structure, entirely roofless, and *minus* all the armour-plating with which it will be enclosed.

Until the plating is added, there will be seen only the huge upright piers, or supports; the floors, or decks, on which the guns will rest; and the vertical bars, somewhat stockade like in appearance, to which the outer armour will be attached. The fort will carry 49 guns, arranged in two tiers, the upper containing 25 and the lower 24. Accordingly, the framework has rather the look of a skeleton building in two stories. It might be compared to the structural outlines of an amphitheatre, but the interior must be pictured entirely clear of stages and everything else. The circumference has a gallery all the way round, at a height about midway between the ground floor platform and the roof beams. The floor and gallery represent the lower and upper stages for the guns. With these and their supports, and the armour to be added, the whole mass of ironwork is exclusively concerned. It is an empty circus, the architecture of which is all at the circumference. The appropriation of the interior space of the fort is a matter with which the constructors of the framework are not concerned. The circular fabric which they have put together is divided into bays, in each story, by the massive vertical piers, 25 in number. These divisions, along two lines (upper and lower) of 600 feet—which is the length of the circumference—afford ample space for a gun in each; and the piers are so shaped in their inner portion as to allow the free play of the gun on its swivel pivot.

As regards the details of the structure, the component parts to be noticed are mainly the three classes above-mentioned—the decks, or floors, for the guns; the vertical piers; and the massive upright bars for the armour. To take the piers first—they are composed of wrought-iron plates three-quarters of an inch thick. Their dimensions are about 13 feet 9 inches by 7 feet 6 inches, and 22 feet high. Their hollow insides will be filled with concrete. The upright supports for the armour —which we have compared to a stockade in their present appearance— are solid bars of wrought-iron, some measuring 12 inches by 8 inches, and the others 12 inches by 5 inches. These immense upright bars are repeated all the way round the outer rim of the structural circle, in the spaces

left between the piers, and they uniformly extend from top to bottom. These and the piers, therefore, with the armour to be added, constitute the wall of the fort. The next element for review is the composition of the two decks. Both the upper and lower will be formed of enormous wrought-iron beams, laid horizontally, the outer ends of which will be carried by the iron structure itself, and the inner ones by the buildings within the fort; the spaces between the beams will be covered in with half-inch wrought-iron arched-plates, well riveted to the beams, and filled in with concrete flush to the actual gun floor, which will be formed of timber planking, carried by these wrought-iron beams. There are also three horizontal external rings, one flush with the masonry and the other two at the levels of each deck as described, which are composed of solid wrought-iron plates 3inches, 2inches, and 1½inches thick respectively, and form a most important element in the strength of the structure. All the materials are of the best and most costly description of armour-plate iron, and have been furnished by Messrs. Cammell and Co., of Sheffield. Many of these plates are 26 feet in length, and one of these alone would represent a cost of about 170*l.* sterling. Without inquiring the exact number of them in the whole of this stupendous array of ironwork, the example just given is enough to prepare one for the total estimate of the price, recollecting that the multitudinous ribs and bones of the fabric are knit together from floor to roof all along a circumference of 600 feet. The cost of the fabric alone of the two forts, one of which we are describing, is about 900,000*l.*, exclusive of the armament. The Horse Land and No Man's Land Forts correspond in all respects, except that the foundation for the latter has been rather the more costly of the two.

Before turning to the foundations, however, something must be said of the general character of this ironwork. All the military officers and professional authorities, who have inspected it, concur in pronouncing it superior to anything of the kind erected heretofore. The Fairbairn Engineering Company, in order to meet the requirements of the Government in this important undertaking, have incurred a large outlay in providing special machinery to facilitate the production of the two forts and works of similar magnitude. As may be supposed, a large space of ground has been entirely occupied by the erection of the first fort during the 14 months it has been constructing. As soon as it is removed, the same grounding will be occupied for a similar length of time with the second fort. A special workshop had to be fitted up for the work, and a great number of the best and newest of Whitworth's tools had to be provided, as much to insure the accuracy of the work and perfect adjustment of all its parts as to expedite its progress as much as possible. With the latter object, for instance, multiple drills were provided of the newest design, costing 500*l.* a piece, and each drilling 30 holes at a time—no superfluous speed, considering that the number of holes to be drilled, all in their exact places, is reckoned by millions. The edge of every plate throughout the structure

is planed, every hole has been drilled, and the edges of the iron were afterwards taken off by machinery, to prevent the force of a shot shearing the fastenings. All the plates had to be planed to the true circle outside. Before the artificers' work could be entered upon, the planning and marshalling of this bewildering multitude of details required long and careful labor. This has been effectually carried out by the Fairbairn Company's Engineer, Mr. H. M. Harman, C. E., in accordance with the general design of the work received from its authors at the War Office; and the precision with which everything was foreseen and calculated may be gathered from the fact that when the whole circle of iron-plating came to be put together, not a farthing of expense had to be incurred in correction, so perfect was the adjustment of every part. All this nicety and finish must seem more remarkable to non-professional eyes, looking at the unwieldy character of the materials employed. So exceptional was the severity of a great part of the manual labor involved in the actual combination of parts, that only the most powerful workmen were equal to the strain. As already indicated, these two iron sea forts will be the very first of the kind that the world has seen. As regards the strength of their framework for resisting attack, it is to be noted that being in the strictest sense homogeneous throughout, it has the great advantage that whenever a shot strikes it the force impact is taken on the entire structure, and not upon an isolated point.

The armour-plate casing round each fort will be formed of three thicknesses of 5-inch plates, having spaces of five inches between each, filled in with Portland cement concrete; but opposite to each gun there will be 17 inches thickness of armour-plates and 10 inches of concrete, the whole secured to the upright bars and the piers. Annexed are particulars of the 49 guns of the fort:—

Guns in Lower Tier:—Twenty-four 12-in. guns of 25 tons, throwing projectiles of 600lb., with a charge of 85lb. of new pebble powder. Initial velocity of shot about 1,300 feet per second, and total energy at muzzle 7,000 foot tons; at 800 yards, 6,000 foot tons. Palliser projectiles from this gun will, at 200 yards, pierce 14-in. of armour, and, at 1,000 yards, about 13-in.; at 2,000 yards, say, 12-in. Guns in Upper Tier:—Twenty-five 10-in., 18-ton guns, throwing projectiles of 400lb., with charge of 70lb. of pebble powder. Initial velocity about 1,360 feet. per second. Total energy at muzzle upwards of 5,000 foot tons; at 800 yards, 4,400 foot tons. Palliser projectiles will pierce 12½-in. of armour at 200 yards; 11½-in. at 1,000 yards, and 10½-in. at 2,000 yards. Preparations are also made for five two-gun turrets on the top of the fort, if they should be found necessary hereafter. These turret guns would be of at least 25 tons. To these particulars may be added a few relating to the armament of the two smaller forts. The Spitbank Fort will be of one tier, and bomb-proof. Its armament will be nine 25-ton guns (as before described) in an iron battery, composed of a front made

up of four thicknesses of at least five-inch armour plates, resting against an iron skeleton structure. Three of the guns look seaward, and six guns of less weight in granite casemates look towards Portsmouth Harbour and the land. The total cost of this work will be about 180,000*l*. In the St. Helen's Fort the battery will comprise a large central turret containing two of the heaviest guns and two 10-in. 18-ton guns (such as above described), mounted on turn-tables behind iron walls. The estimated cost of this fort is 120,000*l*.

The works generally have been designed and carried out under the able direction of Colonel W. P. Drummond Jervois, C.B., R.E., who was also Secretary to the Royal Commission. The ironwork of the forts was designed by Lieutenant-Colonel Inglis, R.E., in which, as also in the control of the execution, he has been assisted by Lieutenant English, R.E. The whole of the ironwork of the two principal forts has been constructed and erected at the works of the Fairbairn Company at Manchester, and will be re-erected by them at the sites of the forts, under the superintendence of the Company's Engineer.

Immoveable as it looks, indestructible as it is designed to be, the immense fabric they have completed is about to be taken to pieces for conveyance to the south coast. The trip will, doubtless, be accomplished with that wonderful ease and celerity with which the railway æra has made us familiar. Engineers and traffic managers contemplate a feat of this kind with equanimity. The world in general accepts the performance much as if it were the transport of a toy palace from the dining-room to the nursery, remote as the work is from the thought of child's play. This skeleton fort is an affair of about 2,400 tons in weight, but far more impressive in its visible magnitude, and there seems something colossal in the bare idea of undoing the whole of it, and so packing it off "per rail."

The foundation on No Man's Land Shoal is, we believe, sufficiently advanced to receive the structure. The works, both there and on the Horse Sand Shoal, have proved very troublesome and costly operations, extending over many years. The sites ultimately selected for the four forts agree nearly with the recommendation of the Royal Commissioners of 1859, though one or two positions have had to be abandoned, owing to the difficulty of obtaining a secure foundation. For the Horse Sand Fort the foundation is laid on the shoal at a depth of 11 feet below low water spring tides. At the level of high water spring tides the masonry is 210 feet diameter. Up to a little above this level the entire base consists of massive concrete blocks, with granite and other stone walling on the outside. Upwards, to a level of about 16 feet above high water, an outside wall of granite and Portland stone of great thickness supports the magazines, shell rooms, and other stores. Upon this structure will stand the two-tiered circular iron fort.

Whether it be the one which has been described as finished or the one about to be begun is immaterial, since there is no difference in

their design. The formations of No Man's Land Fort and Spitbank Fort present no feature very distinct from that of the Horse Sand. At Spitbank the external diameter of the masonry at high water level is 151 feet. For the St. Helen's Fort the foundations were made by sinking a ring nearly circular, and about 130 feet external diameter, of iron caissons through the shoal into the clay below, excavating the sand inside the ring and filling in concrete. The granite-faced structure above high water level contains the magazines, shell rooms, &c.

What may be the permanent value of these works, in a military point of view, it is not the purpose of this article to discuss. The general scope of their design was indicated at the outset in order to set the competent reader thinking for himself, with the aid of such materials as we have been enabled to present, how far the immense interests to be protected will have been really placed beyond the reach of danger. How long may it be before some new development of the resources of attack reduces the apparent superiority of these vast and costly preparations for defence? The question will be asked by those who are unlearned in the subject, but not inexperienced in the course of events, and those who are at once the most learned and the most experienced will, doubtless, be prepared with an answer. The answer of the responsible authorities is, indeed, the works themselves, which would not have been persevered in without the most cogent reasons. Their design has undergone many changes since the time when no heavier gun was contemplated than the old smooth-bore 68-pounder. Mention has been made of "bomb-proof roofs," but, in point of fact, these sea forts are supposed to be beyond the practical need of any such protection from an enemy

There is no roof required for the interior of the circle, within which will be the barracks and storehouses of the fort. It is believed that no hostile fleet or vessel could come near enough under fire of the fort to get the requisite elevation for sending a shell over the roof of the circular gun tiers, or upon it. While so much can be said, the presumption will be that the iron guards of Spithead are as invincible as they look, and that the grand total of expenditure, when the account for each item is closed, will have been justified by what there is to show for it.

II

The Staff College.

THE following regulations regarding the examination of officers who may be candidates for admission to the Staff College in February, 1873, have been issued from the Horse Guards :—

"1.—There will be vacancies for 20 officers, of whom three may belong to the Royal Artillery and two to the Royal Engineers, provided they are among the 20 highest on the list. The qualifications requisite for admission are :—(*a.*) A service of not less than five years previous to examination, exclusive of leave of absence. (This is not to apply to the usual leave of absence granted to officers.) (*b.*) A certificate from his commanding officer that the candidate is in every respect a thoroughly good regimental officer. (*c.*) A report in answer to the following questions regarding the character, habits, and disposition of the candidate, and his general qualifications for employment on the Staff. These questions are to be confidentially answered by a Board, consisting of the commanding officer and the two next senior officers of the candidate's regiment :—*

"Questions.—Is his conduct marked by steadiness and prudence, and is he temperate in his habits? Is he extravagant in his mode of living? Does he display zeal, activity, and intelligence, as well as discretion in the performance of his duties, and does he appear to take an interest in his profession? Report any other characteristic of the officer which renders him suited or otherwise for the duties of a Staff officer. Is his disposition such as would enable him to perform those duties with tact and discrimination, in a manner calculated to insure their being cheerfully carried out by those to whom orders would be conveyed by him; or, are his manners and temper objectionable, and likely to cause him to disagree with those with whom he might be associated or be brought in contact? Is he active and energetic in his habits? Is he a good, fair, or indifferent rider, and is he shortsighted? (*d.*) A certificate that the candidate, if not a captain, has passed the examination for a troop or company. (*e.*) A medical certificate of good health and fitness for the active duties of the Staff. (*f.*) Every candidate before being admitted to the entrance examination will be attached for a month to the Staff of a general officer commanding a brigade or division, who at the expiration of this period will report confidentially upon the candidate's general fitness for Staff employment, and especially upon his aptitude for business and for conducting official correspondence. (*See* General Order 40 of 1871.) Every application to study at the Staff College must be made, while the officer making it is present and serving with

* Officers on half-pay whose regiments have been disbanded are, if possible, to obtain answers to these questions from the three senior officers under whom they have most recently served.

his regiment, through the commanding officer. No application from an officer on leave will be entertained.

"2.—Home Stations. Officers serving in the United Kingdom who are desirous of entering the Staff College must inform their commanding officers before the 1st of May next, by whom the certificates from *a.* to *e.* will be prepared and forwarded, through the usual channel, to the Adjutant-General of the Army. General officers, in forwarding these applications, will record their opinions as to the fitness, or otherwise, of the applicants for Staff work, should they be able to do so from personal knowledge of them. If these certificates are satisfactory, orders will be issued for carrying out the test prescribed in paragraph *f.* General officers will report, not later than the 30th of June, upon the candidates then attached to their Staff; after which date the officers approved of by his Royal Highness will receive from the Director-General of Military Education the rules to be observed at their examination. The examination will be held in London on the 23rd of July next and following days."

"3.—Foreign Stations. General officers commanding abroad will issue their own local orders, specifying the date up to which applications will be received by them from officers wishing to be examined. Care should be taken that sufficient time is allowed for the qualification described in paragraph *f.* to be attained, so that all the necessary papers and certificates may be received at the Horse Guards on or before the 15th of May. General officers, in forwarding these applications, will record their opinions as to the fitness or otherwise of the applicants for Staff work, should they be able to do so from their personal knowledge of them. The examination papers will be sent out for those officers only whose applications shall have been thus received."

"4.—The examination will commence on the 23rd of July, or as soon after that date as the examination papers shall be received from the Director-General of Military Education; but no examination can be allowed to commence after the 15th of August. A Board of officers will be appointed at the most convenient Station of the district, by the general officer in command, and will consist of three officers, one of them to be, when practicable, a Staff officer, having the rank of field officer, and the other two, if possible, not under the rank of captain. One of these officers will belong to one of the scientific corps, when any such officer can be obtained. The questions are to be answered in presence of the Board. The Board will give to each candidate a number, which he will affix to each of his examination papers, instead of his name. He will retain the same number throughout the examination. The Board will give to each candidate a paper of the printed questions on each subject, at the time specified for the examination in that subject. The candidates will write their answers to the questions in the presence of the Board, and their papers, together with the printed examination questions, will be collected at the hour appointed, and made up into a packet, which will be sealed before being taken from the examination room.

The Board will immediately, on the conclusion of the examination, forward the papers of the candidates to the general officer commanding, for transmission to the Director-General of Military Education, accompanied by a certificate that the candidates obtained no assistance from books, or help of any kind, in their examination. The Board will at the same time forward the names of the candidates, corresponding with their index numbers in the examination, in a separate envelope, for transmission to the Director-General of Military Education."

"5.—The following will be the order of the examination;—First Day.—Military drawing and Hindustani, three hours each. Second Day, Fortification,, six hours. Third Day.—Mathematics (obligatory), six hours. Fourth Day.—Mathematics (voluntary), six hours. Fifth Day. —Military History and Geography, first and second papers, three hours each. Sixth Day.—French, three hours; Chemistry, three hours. Seventh Day.—German, three hours; Geology, three hours."

"6.—The examination in military history and geography will comprise the following subjects, as stated in General Order 75 of 1871, viz.: —(1) The Campaign of 1814 in France. Candidates will be expected to have a general knowledge of the geography of the country, that of Champagne in detail. (2) The general principles of war; text-books, Jomini, *L'Art de la Guerre*; Hamley, *Operations of War*."

"7.—There will be in all cases an interval of not less than one hour between the two periods of examination on each day. The papers will be collected at the appointed hours by a member of the Board. Any candidate, however, who may have finished his examination paper on any subject before the hour named, may deliver it into the hands of a member of the Board. Paper, pens, and ink will be provided, but candidates may bring their writing and drawing materials, instruments, &c., and also the tables of logarithms they are in the habit of using. No other books or notes of any description will be allowed to be used. No communication whatever will be allowed between the candidates at the examination.."

"8.—General officers commanding at foreign stations will place no restrictions upon officers competing, further than the exigencies of the Service may absolutely require. It will be understood that the rule by which only one officer can be spared from a battalion at a time for the purpose of studying at the Staff College does not apply to candidates from battalions which have officers now at the Staff College, but whose course of study will terminate in December next."

"9.—General officers commanding at foreign stations will select the hours for the examination which are best suited to the climate and circumstances of the country, taking care, however, to conform strictly to the number and distribution of the hours as detailed in the foregoing regulations."

"10.—On the completion of the examinations, general officers commanding will transmit the candidates' papers to the Director-Ge-

neral of Military Education, War Office, Pallmall, with the least possible delay, in order to enable officers from distant stations, who may be successful in the competition, to join the College early in the following February. They will, at the same time, forward to the Adjutant-General a return of the officers examined. Candidates are recommended to obtain the reports of past examinations for admission, with copies of the examination papers, published by Messrs. Taylor and Francis, Red Lion Court, Fleet-street, London."

III

Practical Instruction for Staff Officers.

The Field Marshal Commanding in Chief has approved the following course of instruction for officers who have passed through the Staff College when attached to the various arms of the Service, as stated in the regulations for the Staff College :—

"Cavalry Officers attached to Infantry.—Without wasting time on matters of detail, cavalry officers are to be well-informed as to battalion and brigade drill, and their attention will be particularly drawn to the following points :—The component parts of a company—battalion and brigade ; the definitions and terms used ; manner of seizing a company ; degrees of march ; relative proportion of paces to files, and the mode of calculating the number of paces required for a battalion of given strength, whether in column or line ; also for a brigade of given strength. The manner of inspecting a company or battalion on parade ; the mode of putting on the accoutrements and packing the valise ; alignments, points of formations, base points and markers ; formations best suited to different kinds of ground ; different modes of firing ; manner of skirmishing ; relative strength of skirmishers, supports, and reserves ; modes of posting sentries by day and night ; conduct of patrols ; positions best suited for pickets, relative strength of pickets, supports and reserves ; orders to be given to an officer in charge of a picket ; formation of advanced and rear guards on the road and in open country ; definitions and terms used in shelter trench exercise ; time taken in forming any given intrenchment. They are to acquire a general knowledge of the annual course of musketry, and to compare the interior system of an infantry with a cavalry regiment, and the rates of pay and messing."

"Cavalry and Infantry Officers attached to Artillery.—They will be required to attend all parades, mounted or dismounted, of the brigade or battery to which they may be attached. They will accompany the orderly officer through the performance of his duty, so as to become acquainted with the mode of carrying on the duties in quarters. Infantry officers will attend mid-day stables daily, and stables on the return of the battery from the field. All will acquire a general knowledge of standing gun drill and the general principles of battery and brigade drill in the field. They will be on parade when 'turn out' sounds, and learn how to inspect a battery both on foot and when mounted. They will direct particular attention to the following points :—Nature of gun used by Horse Artillery and Field Batteries ; its construction, weight, and calibre. A general knowledge of the component parts of the gun-carriage, limber, and waggon. The different carriages belonging to a battery of Horse and Field Artillery, with their various uses ;

different kinds of projectiles used with Field Artillery. A knowledge of the different kinds of fuses, their uses, and mode of preparing and firing them. Ammunition, camp equipage, men's kits; number of rounds of ammunition carried per gun; total weight of gun and carriage, also waggon, when packed, in marching order. Fitting of collars, saddles, pads, breechings; length and direction of draught, weight carried by riding and hand horses, lead and wheel, in marching and drill order; fitting of horse appointments of non-commissioned officers and gunners, packing and putting on valises and cloaks, turning out in marching and drill order. Stable Management (Infantry officers only)—Shoeing (general principles), times of feeding, quantity of forage allowed per horse per day, watering, general duties of officers and non-commissioned officers. Average rate of marching of Horse and Field Artillery. Special duties of Horse Artillery in combination with cavalry, and Field Artillery with infantry. Position of artillery in the field, rules for taking up positions, the importance of cover for guns, their limber, and ammunition waggons; position of the latter with reference to the guns. The projectiles that may be used with the greatest effect against columns of troops, earthworks, over firm or marshy grounds, &c. Grounds occupied by a battery in line, at full, half, quarter, and close intervals. Distance between guns in line in open, half, quarter, and close intervals. Interval between batteries in line, in open, half distance, and close columns. How to dress guns when brigaded with other troops. Articles of clothing, necessaries, and equipments supplied to men. Rates of pay and messing."

"Artillery and Infantry Officers attached to Cavalry.—Cavalry drill and field duties, a general acquaintance with regimental and brigade drill. Formations used in cavalry; general principles of field movements of cavalry; circumstances to which various formations and movements are best adapted; frontage, intervals, distances, and depth required for bodies of cavalry when formed on parade; inspections of regiments; parade movements ordinarily executed; points to be particularly noticed in the inspection of a cavalry regiment; general principles regulating the employment of cavalry in presence of an enemy; disposition of supports, reserves, &c., combined action of cavalry and artillery, duties of cavalry supporting artillery; duties in the field for which various kinds of cavalry are best adapted; employment of cavalry as skirmishers, mounted and dismounted; outpost duty, patrols, reconnoitering, and foraging parties; marches, ordinary rate of cavalry march; disposition of advance and rear guards, flankers, &c.; strength and formation of Royal and other escorts; employment of cavalry for baggage guards and convoys, mounted orderly duty, &c.; employment of cavalry in street fighting and riots; interior economy, organization, &c., of cavalry.—Classification of cavalry in the British service. Difference in arms, equipment, &c. Organization of a cavalry regiment; proportion of dismounted men, necessity for, and duties of the latter. Ordinary routine of daily duties, and of weekly and monthly inspec-

tions, or, in a cavalry regiment, so far as they differ rom similar duties in other branches of the service. * General acquaintance with stable duties and regulations regarding shoeing and management of horses. General acquaintance with the saddlery, equipment, kit, &c., of cavalry, the mode in which they are fitted and carried. Average weight carried by the horse. System of supply of clothing, necessaries, &c., so far as different from that in other branches of the service. Different 'orders' in which cavalry turn out for various kinds of parades. *General acquaintance with the system of riding instruction, both as regards recruits and trained officers and men. Average time required to train young horses and recruits. *Regulations regarding forage, issue, inspection and rejection of it. Regulations for the sword and lance competition, and for musketry practice in the cavalry service. *Purchase and casting of horses. Grounds for which horses may be cast. Cavalry duties on a march, treatment of horses. Arrangements for the transport of dismounted men and light baggage. Regulations regarding billets, system of pay, &c., messing. In regard to the method of carrying out the instruction in the above subjects, the officers if of infantry, will attend mid-day stables daily for a certain time, and more especially after field days, in order to acquaint themselves generally with stable duties, and to understand the amount of time taken up by those duties in the mounted service. They will also be present at riding drill for a certain time, in order to gain an insight into the system of instruction of both men and horse. These duties will not be required from officers of Artillery. All officers, however, will take orderly duty (as supernumeraries) a sufficient number of times to obtain a practical acquaintance with the nature of the duty, and more especially to enable them to understand the points in which such duties differ in different branches of the service. They will also be required to attend all adjutants' drills, whether mounted or on foot. At adjutants' drill they will be required, as soon as possible after joining, to learn the mode of placing bases, &c. At regimental field days they will accompany the commanding officer. At brigade and divisional field days they will, as far as possible, be employed with the Staff for the purpose of acquiring a practical acquaintance with Brigade-Major's duties in the field. Office Work.—To enable these officers to take up office duties without difficulty, they will attend at the orderly rooms, and also at the brigade office, three or four at a time, as may be arranged, and work under the Brigade Major till they have mastered the following subjects:—Registry of papers: mode of keeping office books, records, rosters, &c.; method of conducting correspondence; departments to which correspondence on various subjects is forwarded; subjects of correspondence with the Control Department; applications for routes; communication of orders to regiments; divisional and brigade standing and daily orders; practice in writing orders; returns, reports, &c., periodically required at brigade offices from regiments, and at superior offices from brigades;

* Will not be required from Artillery Officers attached to Cavalry.

examination and checking of returns; courts-martial and Boards of various kinds; duties of Staff officers in regard to these subjects; business connected with applications for leave of absence, furloughs, passes, &c.; arrival and departure of regiments; duties of Staff officers in regard to these subjects; preparatory arrangements for flying columns; requisitions for camp equipment, transport, &c. Regulations in regard to the garrison military police, and the crimes of men taken up by them; inspections of regiments; routine to be followed in different branches of the service; returns, &c., required in connexion with inspections; books which have to be shown at inspections; a general acquaintance with War Office Circulars and General Orders to which frequent reference is required in the transaction of ordinary brigade-office business. General Subjects.—They will ascertain what are the methods of encamping and picketing; the camp equipment necessary for different arms of the service; mode of carrying it out; regulations for the march of brigades and divisions, and for the baggage trains of the same; embarcation and disembarcation of troops of all arms, both on ships and railways; special duties of Staff officers on these occasions; the placing of points for parades; noting especially the difference of the systems of keeping regimental books and records; the difference of the system in enforcing discipline, especially as regards tattoo, punishments, and meals; the time necessary for corps turning out, both in ordinary cases and when hurried; the time required to pass over a bridge or through a defile in ordinary formations; the necessary precautions to be observed by all arms in crossing pontoon bridges.

"No leave of absence will be granted, except from mid-day on Saturday till Sunday night, without the sanction of the general officer commanding the brigade, who is responsible that the officers are duly instructed. As it is essential for the efficient performance of their duties that Staff officers should be acquainted with the tone and feelings of the officers of all branches, no officer will be permitted to live out of mess while attached for instruction. At the expiration of the time during which an officer has been attached to a corps, the commanding officer will report to the general officer commanding the brigade—who will countersign the report—stating whether he has acquired the necessary information on the foregoing points."

IV

Health of Sailors and Soldiers.

Dr. T. Graham Balfour, F. R. S., Deputy Inspector-General of Army Hospitals, and head of the statistical branch of the Army Medical Department, read on Tuesday evening, the 19th instant, before the Statistical Society, an interesting paper on the "Comparative Health of Seamen and Soldiers, as shown by the Naval and Military Statistical Reports." On comparing the infantry regiments in the United Kingdom between 1859 and 1868 with the naval force on the home station during the same period, the sickness in the navy, as measured by the admissions into hospital, appears to have been one-fifth, and, by the proportion constantly sick, 1·20 per 1,000 of the strength higher than in the army; and the deaths from all causes to have been ·48 per 1,000 higher; but the invaliding to have been about one per 1,000 lower. Excluding accidents and injuries, which are much more frequent in the navy than in the army, the admissions into hospital of sailors have been one-ninth higher; but the deaths have been ·70, and the invaliding on account of disease 2·28 per 1,000 of the strength higher among the soldiers. The difference in the rate of mortality may probably be to a great extent accounted for by the difference of age in the two services, the proportion of boys—at that age when mortality is at its *minimum*—being 10 per cent. of the force in the Navy, and a little above 3 per cent. in the Infantry. The excess of admissions in the navy has been chiefly in miasmatic diseases, particularly eruptive fevers, dysentery, and diarrhœa, sore-throat, and erysipelas, diseases of the respiratory and digestive systems, in boils, abscesses, ulcers, and in accidents; while in the army there has been an excess in ophthalmia, venereal diseases, and the group of unclassed diseases. The influence of diet in the causing among sailors of diseases of the digestive system and of the skin has frequently been observed. On the home station the admissions from dyspepsia in the navy were 37, and in the army 13 per 1,000. Colic, also, caused 10 admissions per 1,000 in the navy and three in the army. On the home station the navy enjoyed a marked exemption from tubercular diseases; the admissions from consumption were four, and the deaths ·40 per 1,000 of the strength lower than in the army. The invaliding for tubercular diseases was also one per 1,000 lower than in the army. On the Mediterranean station, however, tubercular diseases were rather more prevalent and fatal in the naval than in the military force, and the invaliding for these diseases from the former was more than thrice as high as from the latter. *Delirium tremens* and epilepsy appear a good deal more prevalent in the navy than in the army. Thirty-five years ago, when public attention was first thoroughly

directed to the consideration of the health of the army and of the means necessary to improve it, the mortality, so far as could be ascertained from the imperfect data, amounted to at least 3 per cent. annually; on the average of five years—1865-69—it was under $1\frac{3}{4}$ per cent. Taking the strength of the army, exclusive of colonial corps, from the Army Estimates for 1871-72, as 184,000 non-commissioned officers and men, the difference in the mortality represents a saving of above 2,300 lives annually—a saving of no small importance, and representing, even at the lowest estimate of the cost of production of a trained soldier, a large sum of money, which would be necessary to replace these men. It must not, however, be supposed that this money value has been all realized in a reduction of expenditure—many of the improvements referred to have been effected by means of a large outlay; but even after making a very liberal deduction on this account, there will still remain a considerable pecuniary saving as a result of these measures. It should also be remembered that another consequence of this judicious expenditure has been to remove some of those objections to service in the army which rendered it unpopular, increased the difficulty (and consequently the expense) of recruiting, and deterred a better class of men from joining its ranks. In the discussion which followed Dr. Balfour's paper, Dr. Webster, Dr. Mackay, R.N., Dr. Mouat, Inspector-General Lawson, Mr. Rawlinson, and other members and visitors took part.—*Medical Times and Gazette.*

TRANSLATIONS.

I

The Battle-Field of Sedan.

[*A translation from the French.*]

DURING three long months France has undergone so many experiences, and been racked by such an agony of hope and fear, that taking up my pen, as I now do, to write of Sedan, I feel as if I were dealing with events long passed. It is true that our sorrow has not yet become tranquil, and in all true French hearts the open wound is still unstaunched; but, nevertheless, it is incumbent on us who were spectators of that catastrophe to say what they saw, and to furnish the materials upon which history shall form its verdict. I feel, moreover, as if I were only fulfilling the demands of justice in attesting to the character of our army, that army which was rather crushed than conquered, and to the stuff of which our soldiers showed themselves to be made in those terrible days. Full of ardour, habituated to victory, marching to fresh battle-fields proud in the memory of their past triumphs and confident of future achievements, it soon became their lot to discover that bravery is not at all times all in all; and that heroism is ineffectual when the direction of these hardy virtues is confided to inefficient leaders, and to a commander-in-chief alike irresolute, incapable, and sluggish. Even then, though realizing that they were victims, they knew how to do their duty. The encouragement of example and military skill, which were absent in their leaders, were replaced by the devotion of the soldier. If personal intrepidity and inherent pluck could have achieved a victory over an iron discipline and superiority of numbers, in spite of the incapacity of their chiefs, the day would have been theirs. Failing in this, they have given their blood, and their sacrifice of self, deny it who will, and their devotion to their country—in a word, the conviction of their nationality had found root in the souls of those humble and valiant ones. The following recital is sacred to the memory of the glorious vanquished. If it were not that out of those disasters a sentiment of fortitude is evoked, it might be asked by some who read these lines why a French pen should recall those heart-rending scenes. We need only to look the truth in the face to be assured of this. The very depth of the calamity demands that we should retrieve it. Far from sinking down smitten by the blow, will it not be the part of France to draw from it a lesson of that exalted bravery which alone can save her?

Macmahon's army defeated at Reischofen and at Wœrth, had fallen back on Châlons by Sarrebourg and Nancy, forgetting to destroy the tunnel at Saverne which would have delayed the enemy's progress for several days. Douay's division, to the command of which brave General Pellé had succeeded at Wissembourg, was driven back as far as Neuf-

chateau before it commenced to rally. It then re-occupied La Veuve and La Mourmelon, where it re-formed under great disadvantages, the gaps made in the ranks of Turco and Zouave being filled up by young recruits. It was a sad yet proud spectacle to see those of our soldiery, who, though decimated by the fire of the enemy, wasted by hardships, worn out by fatigue, their clothes in tatters, and many of them wounded, nevertheless shrank from the ambulances, and begged only to be led into action; among them also might be distinguished the cuirassiers with bandaged heads and battered and pierced cuirasses. The Gardes Mobiles of the Seine, who were encamped on the Chalky plain of Mourmelon, gazed with sympathy and respect on these men, who had escaped the bloody fights of the early days of August, and formed the imposing remains of the most intrepid army in the world—the old legendary army of Africa.

When it was seen that all these troops reinforced by detachments from Lyon and Belfort were being massed round Châlons, and were taking up their position on those plains and eminences which had for several years been the theatre of the education of French military strategy, where their camps of exercise had been formed, and which had been the scene of many a sham fight, no one doubted but that it was here that Macmahon intended to make his final effort. It would, indeed, have been the fittest and most auspicious spot for it, for it was here that France gained the day when the invading hordes of Attila were shattered. The white slopes of the 'Champagne' here formed an amphitheatre, from the crest of which our numerous artillery, re-organized, and of a total strength of 400 guns and seventy '*mitrailleuses*', could easily have crushed the enemy. There is not a man who could not well have believed that the fate of the war should have been decided on these plains once recking with the blood of the Moor.

So thought the soldiers as they prepared for the struggle. Drawn up in order of battle, they seemed to await daily the attack of the enemy, who was advancing by forced marches up the valley of the Aube. It was reported that the Prussians had entered Troyes on the 18th August and had occupied Arcis. The sound of their cannon could be distinctly heard in the direction of Vitry. A portion of General de Failly's army was then in the act of abandoning Vitry, and was falling back on Macmahon. Grey with dust and haggard with fatigue, they marched across the plains of Châlons with bands playing and vociferously demanding battle and vengeance for Forbach. However disastrous had been the double defeat of that dark 6th of August, the spirit of hope had been re-born, and there was not a thought but to wipe out the stains with which the reverses of Spicheren and Freischwiller had blemished their standards. It was only some officers of inferior rank, who, at the risk of their lives, and sword in hand, had attempted by efforts of personal intrepidity to retrieve the incapacity of their generals: it was only these who shook their heads, and looked with apprehension to the future. They saw that the casualties in the

ranks had been so great that they no longer bore a just proportion to the men, and could therefore keep them in hand but imperfectly. They perceived that administrative feebleness was undermining the most unwavering fortitude and the most gallant heroism. Still they had no other thought than to do their duty. An entrenched position was occupied round Châlons, the Mobiles of the Seine were withdrawn to Paris, because it was considered that they were not sufficiently organized to take their place in a line of battle. Nightly shots were expected to be exchanged between the out-posts and the echelons of the Crown Prince of Prussia. One can imagine, then, what the feeling was in the army and among the inhabitants of Châlons, when they learnt that this field of battle, which was looked upon almost as classic ground, was to be abandoned, and that the army was to concentrate on Reims! In one day all the surplus provisions and '*material*' of the camp was burnt. By the orders of the Field Marshal all the forage which could not be carried off, all the barracks and the block-houses, which had for some years been erected at Mourmelon, were destroyed. So great was the haste with which this work of destruction was carried out, that even the oats and the straw were not saved, and from that time the cavalry at Reims were left in want.

It was evident that Reims was only a first step to some strategical point, probably either Grand Pré or Valmy. Frenchmen are such fatalists that already, as in the days of Dumouriez, we began to believe that the defiles of the Argonne would be a Thermopylæ for France. Every one thought that as we were abandoning a position with which we were so thoroughly familiar, and as it had been resolved to advance to the aid of Bazaine, who, despite his victory at Gravelotte, had been enclosed within the limits of the position he then held, it was a certainty that we should march straight to him by Verdun, Monheulle and Gorse, and a rumour gained ground that our advanced guard was already as far as Sainte Ménéhould.

This seemed the natural direction in which to operate to effect a junction with Bazaine, and to free the army of Metz which had fought at Mars-la-Tour, Rezonville and Saint-Privat. If our information was accurate there was every need for hurry. A Parisian Garde Mobile, who had made his way alone on horseback after traversing the Prussian lines, brought to the camp at Châlons the news that Bazaine's ammunition had already failed. Thirty wagons containing a million cartridges pushed on to Montmedy and destined for the Marshal, were detained there. A part of Prince Frederick Charles' army occupied Brecy, and was extending itself in the direction of the Belgian frontier. The success of a movement on Metz depended entirely on the rapidity of its execution. It was imperative to check the Crown Prince, who was marching up the valley of the Aube, and to bar his advance to Paris in our rear, or else by a rapid march to advance straight upon Frederick Charles and attack him in rear, while our troops shut up within Metz should engage him in front and fight it out to the death.

Days, even hours, under such circumstances, were as precious as ages, and hours flew by and days passed, and no decision was come to. At last, on the morning of the 23rd August, on a rainy cheerless day, the army of Châlons, 200,000 strong, under the command of Macmahon, left Reims in the bleak and chilly dawn. They marched but slowly in the rain and mud, the colors in their black covers, the ensigns of the ambulances soaked through clinging to the poles, and the mitrailleuses encased in their leathern coverings. Thus the army crawled along the roads, while the dreary sounds of the clocks of Notre Dâme of Reims bade them a mournful adieu through the rain.

It was the universal opinion that we were marching on Varennes or Verdun. How was it possible to suspect that such a large force would, as if with all the pleasure in the world, deliberately involve itself in a difficult passage through the narrow space which was left unoccupied between the Prussian army and the Belgian frontier? To go there was to expose oneself to the most palpable dangers, from which extrication would be a most delicate task—and retreat impossible. In front was the enemy, and in rear the frontier. If we were beaten, we could not escape being forced back on to neutral territory, and there disarmed by the corps of observation posted in échelon from Namur to Arlon. An extraordinary strategical combination indeed, the perils of which were plain as daylight to the most ignorant without even the necessity of consulting a map! History will not be slow to suggest that some people, and especially the Emperor, had a sneaking partiality for a position where, in case of disaster, the frontier at any rate afforded an asylum. I did not follow the march of the army to the Ardennes. I quitted Reims when the Prince Imperial left for Réthel, by which three train loads of famished soldiers were left waiting in the station for several hours, and which occasioned the insubordination, disorder, and pillage of the bread wagons by the troops—a sad and painful episode, of which the public has been informed by the papers. The soldiers were exasperated. Their want of discipline was the fruits of the irresolution of their leaders. The army first marched on Réthel, and thence made in the direction of Stenay and Montmedy in the hope of forming a junction with the force at Metz by way of the Ardennes; but, it is scarcely necessary to repeat, the manœuvre was commenced too late. Prince Frederick Charles had, in anticipation of the movement, pushed forward a small corps of cavalry or infantry from Briey on Lony and Montmedy, which disturbed the district, made their appearance everywhere, occupied the villages, appeared and vanished, clung to the trail of our soldiers as if by scent, and by a scientific distribution of their forces always managed to concentrate when an engagement became imminent. On the other flank, the Crown Prince on arriving at Châlons retraced his steps, and marched in quest of our troops in hope of taking them in flank. This did not matter much, and if our generals had turned to advantage French '*élan*' they might have made good to the very uttermost the hours which had been wasted at Châlons; but a perusal of

the despatches of those days will show at a glance the inefficiency of our officers. Their incapacity attained tragically burlesque proportions. The Emperor searches for his army, gets uneasy, questions, fumbles; the Generals wanting in firmness know scarcely more than he does. Everything runs foul of everything as in a fog. It makes one wild to think of these hesitating faltering corps d'armeé pitted against troops which were servilely carrying out a plan of campaign thoroughly well pre-considered, and against adversaries who fought as if they were the automatons of a master spirit.

The Grenadiers and Artillery of the Belgian Army were posted along their frontier, and watched the struggle which was being carried on almost under their very eyes with considerable anxiety. The Belgians were very much maligned by us before the war, because we were singularly ignorant of the state of their feelings. Belgium was by no means ill-disposed towards France. They were naturally enough uneasy at the designs and ambitious schemes of the man who was then at the head of affairs in this country, and thus, though they devoutly hoped for the defeat of the Emperor, they at the same time sympathised warmly and sincerely with France and the French. How often have we been affected—affected even to tears—by the marks of sympathy and touching kindliness with which they greeted the French soldiers who had sought shelter in their territory. There was nothing feigned, nothing unreal in their conduct. The Walloon population, French in their language and in their associations, were unmistakeably distressed when they heard the Prussian Artillery opening from the direction of Longwy. They hurried in crowds to the frontier, lent aid to the wounded, cheered and consoled them, treating them with the greatest care; while the Belgian Army, which, as I can bear witness, had become a little excited by the smell of powder and saltpetre which was wafted from France, more than once showed signs of that feverish restlessness which Dante calls the 'infection of battle and strife.'

At Givet, where I was, they were busy fortifying the citadel, one of the strongest in the district: like another Gibraltar it was perched on the crest of a rugged hill, and rising to the clouds seemed to defy assault. But at Givet, as elsewhere, the Government had left the fortifications without guns, gun-carriages or ammunition. The Ardenneses of the neighbourhood hurried thither hoping to find a refuge in the fortalice, which, as it was as useless for defensive purposes as if it had been dismantled, it could not afford them. Parapets were thrown up in haste, the young men were drilled, and the embodied peasantry mounted guard in their blue smockfrocks over the cannon, which were manned by volunteer artillerymen. Meanwhile, the successes which we were said to be gaining over the Prussians at certain points were circulated, whispers of victories gained convulsed the little town. One could not help feeling moved at the eagerness with which the women and children, and the restless folk generally, seized upon these frail assurances: some affirmed

that the Prussians had been beaten at Buzancy,—others insisted that it had happened at Attigny. Some spoke vaguely of an engagement at Varemos, in which guns had been captured and the Uhlans defeated. One thing at least was certain, that some 'Franc tireurs' had set on fire the woods of Mont-Dieu, and 'les grands-armoises,' under cover of which the Prussians were formed, as they had been at Wissembourg and Forbach. In the middle of all these re-assuring reports, which each had accepted according to the measure of credulity every one is disposed to attach to news ardently desired, came intelligence of the actions at Beaumont, Mouzon and Carignan.

On the 30th of August General de Failly was at Beaumont, and with inconceivable neglect took so few precautions in the face of the enemy, of whose exact whereabouts he was ignorant, that Prussian bullets gave the first intimation of the presence of the foe, while our men were halted with their ranks in disorder between two lines of wagons which lay on the road, and were in a measure hampered by being between the requisition-carts and impedimenta of all sort. One can imagine the situation of an army attacked in such a dilemma, and fired upon at discretion. The wagons were the very reverse of a protection, for the horses either plunged or fell on both sides of the road, and the panic stricken peasants who were driving loosed the reins and fled. They were terribly in the way and heightened the confusion. Thus, at the crisis of a sudden attack, our soldiers, through the culpable neglect of their General, were standing 'pêle méle' without any order of battle, and were half-beaten before they had a chance of being engaged. Still they fought. The enemy advanced in overpowering numbers, and attacked our comparatively weak corps with a complete corps d'armeé. It was another instance of their system of crushing opposition by numerical superiority. It is no exaggeration to say that the men under General de Failly were as one to six. By the evening, in spite of their bravery, the battle was lost, but ultimate success was by no means compromised, for Macmahon had under cover of night reinforced de Failly very strongly from Carignan, and thus prevented the renewed attack on the fifth corps from becoming a rout.

The battle was certain to recommence in the morning, for the enemy were too wise to allow respite to our heroic but worn out and famished troops—for these French soldiers—it is hard to have to record it—were dying of hunger in the deserted French villages. The enemy, who were fully alive to the difficulties before them, redoubled impetuosity. After a day spent in fighting and a night without rest, they had still before them the prospect of a battle, while the only food they had was a sup of broth, or a mouthful of bread devoured on the line of march.

The battle of Carignan was as severe and more disastrous than that of Beaumont. Its result really decided the fate of the campaign, and the never-to-be-forgotten morrow was but the sequence of this stubborn struggle in which, perhaps, more than in any other engage-

ment of the war, the battle became a butchery, after a hand-to-hand encounter and an artillery duel. The enemy, decimated by our mitrailleuses, renewed the attack with furious courage. They paid with their blood for their victory. The crimsoned waters of the 'Chiers' were choked with German corpses. Under the fire of shell which set Carignan ablaze Macmahon recovered his military energy, and that heroism which had at Reischofen made him, if not a brilliant general, at least a right gallant soldier. Once more forced to yield ground to superior numbers, he abandoned Carignan after an intrepid defence, and though he retired a beaten general, he had at any rate the bitter consolation, that on the relinquished battle-field the Prussian and Bavarian dead cumbered the ground in thousands. That evening the Emperor, who was stupefied with the defeat, telegraphed to the Empress this amazing despatch, dated from Carignan :—"There has been to-day another engagement of no great importance. I was on horseback for a long time."

On the first of September, after the engagements of Petito Kemilly and Bagrilles, at dawn of a bright quiet morning, the slaughter which had lasted, through three days recommenced more horribly than ever. Macmahon, under cover of the guns of Sedan, extended his army along the right bank of the Meuse, and faced the Saxons and Wurtemburghers who were posted at Kemilly under command of the Prince of Saxony. He was soon to have against him the whole strength of the Prussian Army, except the corps d'armeé under Prince Frederick Charles, which was at that very moment employed in keeping in check the army of Metz, and was staggering under the weight of their onset. One can picture to oneself this corner of French territory overrun with its enemies, bristling with German soldiery. On the hills which enclose Sedan, and form a large tunnel-shaped circle round it within which the citadel nestles, our troops exhausted, harassed, embittered, without any confidence in their chiefs, with no hope even left, and with no other incitement to gallant behaviour than the fierce surly rage of the beaten soldier—our troops, I say, were disorganized, and through their ranks were bandied bitter jests of veiled meaning levelled against their generals. These soldiers who had been accustomed to form line of battle and charge with bayonets lowered, and to the sound of music, were now to attack no more: for three days they had been on the defensive. It was to be their portion still.

The corps of the Prince of Saxony occupied the centre of the enemy's position. On the right from Brévilly to Poaru were the Bavarians, who had just burnt Bazeilles, and were being massed and reinforced by the Prussian Royal Guard. It was evidently these who were destined for the attack. When morning broke they threw out skirmishers, and opened a heavy fire on La Moucelle ; then they attempted to take the place with a rush at the point of the bayonet, this time without cover of any kind. They gained the streets of the village, but were repulsed by our men. They were hurled back ; rallied, and

came on a second time. The position of LaMoucelle was to be held at any price, for it was to the Prussians the key of the battle-ground. To the Bavarians had been assigned the post of honor and the post of danger. House by house they struggled for its possession, and street by street they stormed the barricades. It was a fight to the death, and the slaughtered Bavarians fell in heaps in the main street. They were mowed down by grape, until the dead were kept erect by the support of the masses which had fallen before, so thick were the slain. At the same time the Royal Guard attacked Douzy and Rubecourt, both little villages which nestled in the forest of the Ardennes, white, smiling, and as if set in a green casket, but where death—death fierce and remorseless, was busy. From dawn to eleven o'clock our soldiers resisted gallantly, and repelled the onslaught of Pomeranian Grenadiers and Munich Chasseurs. But while our people were keeping these at bay with the courage of despair, and the enemy was shattering its ranks fruitlessly, another Prussian army still, more numerous, by a singularly well-conceived and daring march, with long swinging gait, made its appearance on the field of battle. It was the army that had been victorious at Wessembourg and Wœrth.

It was the army of the Crown Prince, the army which Macmahon had been waiting for at Châlons, but which when it debouched on Mourmelon, and found our smouldering barrack-ruins, without taking any repose, at once determined it go in search of the enemy it had failed to meet, and setting off at top speed by double marches, by this bold feat emulated the famous flank march which so wearied the Prussian army, but which won the victory of Sadowa. For two days its approach had been expected. The King attacked, certain that the Crown Prince would arrive on the day calculated on. He must certainly have heard the guns of Carignan. From the night of the 30th August to the 1st September, he re-doubled his efforts, and his army marching from Châlons by way of Vouziers, crossed the Meuse at Douchery at the same moment that the Bavarians attacked La Moucelle, and the Prince of Saxony opened fire. Since then the Crown Prince had been bringing his corps into line. He did more; he extended his flank rapidly along the Meuse. At the same that he took up his position on the bank of the river he pushed forward a corps, which, conforming to the formation of the battle-field, fell on Floing and Givonne, while the cavalry under the command of Prince Albrecht, the brother of the King of Prussia, penetrated the forest of the Ardennes, and the Uhlans, hussars and dragoons, being deployed from Flégneux to Pourn-aux-Bois, waited in concealment under cover of the woods, ready to cut off the retreat of our soldiers, who were now attacked on three sides.

Up till 11 o'clock our troops defended La Moucelle and the plain of Bazeilles most gallantly, and with deadly effect on the enemy. As we have seen, they forced the Grenadiers of the Royal guard to retire before them at Kubecourt, they kept in check, and were on the point of hurling back and defeating the immense masses of Prussians, Saxons

Baden-men, and Wurtemburghers—one might say, in point of fact, all Germany—opposed to them, when at 11 o'clock the artillery of Prince Fritz opened a sharp fire on Floring and Givonne, and bombarded our bewildered troops from a distance, bewildered alike by the unexpected cannonade, and by the appearance of a new enemy in still greater force than the first. Everywhere thronged the black masses of the Prussians —uttering wild 'hurrahs,' brandishing their rifles, and attacking on front on flank, on all sides. Our incomparable army yields not yet, still fights on, still hopes.

Hours elapsed in this stern and heroic resistance, but every hour the circle of fire became more and more deadly, more and more vigorous, and enclosed our brave soldiers. Death stalks everywhere. The Prussian artillery with its tremendous range takes up position on all commanding points. The balls hail on the French ranks from an almost invisible enemy. These threw themselves at the point of the bayonet up the hill slopes from whence comes the shower of death. The artillery fire smites them down before they can reach the gunners. Eleven hundred pieces of cannon thunder at once from far on our warriors—our warriors who love to fight with steel. Around them swarm three hundred thousand men, who drive them back and shoot them down, under cover of the woods or from the crest of the hill slopes. Then it was that the army—the unhappy French army,—before that girdle of iron, of fire, of cannon-balls and rifle-balls, recoils, retires, and buries itself within the funnel of Sedan, while from the bristling heights the batteries still roar.

At first our soldiers attempted to pierce and bore through the Prussian lines; they attempted to escape and to work their way out by La Chapelle, by the woods of the Ardennes, and by the open route to Belgium; but the cavalry, the hussars of Death, plunged into the woods, drove them back or sabred them. Driven out of the forests they made for Sedan, while from the crests of the hills of Givonne the Prussian batteries rained their iron-storm on the roads, and lopped off branches, and smote down men. Before these over-powering numbers, before these thousands of cannon, before this terrific development of brute force, our troops, with the spirit of resistance still alive in them, still prepared to defend their colours and their existence against the masses of the enemy; but crushed and reduced to impotence, fell back, and leaving their dead, generals, officers and soldiers, on the hill-sides of the Ardennes, plunged within the walls of Sedan, now so sadly notorious.

R. G. L.

II

Extract from the Prussian "Militar Wochenblatt," a remarkable article on the proposed reorganization of the French Army.

"General conscription is about to be introduced into France. M. Thiers having arrived at a determination on this important head, we are at liberty to utter an opinion on the probable results of the measure. Whatever we may say now can no longer be trumped up against us. France is convinced she requires general conscription to recover her military and political *prestige*, but can she imitate our military institutions without transferring to her soil our political and social organization as well? There are few people in Paris intelligent enough to realize the truth that the two things must go together. The warning they utter is drowned in the deafening cry for *révanche*. Generally speaking, public opinion in France is convinced that if there are any dangers connected with universal conscription the nation is strong enough to resist their baneful effect until vengeance has been wreaked upon *les Prussiens*. Fortunately we are in a position to judge the question more calmly than our excitable neighbours, and can avail ourselves of the long and instructive experience we have had in the working of our military system. As it is sixty years since universal conscription was adopted in Prussia, the following remarks may claim to be based upon the solid foundation of lengthened and thoroughly tested practice.

"The military institutions of a State ought to be adapted not only to its political needs, but also to the nature and character of its society. If one or the other of these requirements is disregarded, chronic or acute disease is sure to punish the neglect.

"The French possess qualities highly valuable from a military point of view. They have a good deal of intellectual vivacity, are susceptible of generous impulses, and in their paroxysms of enthusiasm esteem life but lightly. To the intensity of these qualities, in some periods of their history, they owe their success. To counterbalance the advantage they derive from their inflammable temperament, they are utterly deficient in steadiness. Hurried on by enthusiasm they advance, but the moment a repulse occurs a panic sets in, the glorious army is metamorphosed into a grumbling mob, and a great captain idolized but yesterday is to-day branded as a fool and a traitor. It is too much to expect of a Frenchman that he should be content to do his duty quietly and noiselessly, and disinterestedly follow up a distant aim, which, if promising success at all, is sure not to bring his name into particular prominence. French troops find it difficult to bear defeat, and are unwilling to wrestle with fortune, if she has once declared against them. No Parisian regiments would have marched from Ligny to Waterloo as did Blucher with his Brandenburg, Silesian, and Pomeranian troops. Of course the

inhabitants of Northern France are somewhat more solid and enduring than the people of her Southern provinces; but the difference is too small to alter the general result and really affect the tone of the army.

"Is such a nation likely to renovate itself by the adoption of universal conscription? We doubt it. Universal conscription to work well requires moral earnestness in all classes of a nation. It requires the faculty of self-denial and a willingness to accept unpalatable conclusions when based upon premises acknowledged as necessary and just. Up to a recent date the French army was chiefly recruited from the labouring populations of the villages and small towns. The volunteers and substitutes belonged almost entirely to this class of rural or semi-rural labourers; and as Alsace and Lorraine have always been the most martial dependencies of French, it was only natural that a disproportionately large number of those who served without compulsory obligation should have proceeded from these outlying parts. As to the working men of the larger towns who entered the army, they were too few and too carefully distributed over the various regiments to exercise any very sensible influence upon the tone of the troops. Universal conscription will change all this. Henceforth the more intelligent and well-to-do classes will form a strong ingredient of the line as well as the reserve. Substitutes will disappear, and a more comprehensive enlistment will place large numbers of working men side by side with the peasantry. Another inevitable consequence will be the abridgment of the term of service and an extension of furloughs far beyond what has been hitherto the case. Taking these innovations together, we are justified in anticipating that the French army will become something very different from what we have been accustomed hitherto to understand by the term.

"In the first place, it must be taken into consideration that universal conscription in these modern days is a much heavier burden than it was at the time of its introduction into Prussia sixty years ago. Time and labour have immensely increased in value since the beginning of this century. It is true that unskilled labourers, if they get a really good military education, have so many indispensable virtues fostered in them as to be amply indemnified for the loss of time and wages sustained while under arms; but those who devote themselves to commerce and industry, or science and art, will never be able in these pushing times to make up for the loss of a year or two spent in rank and file. In Germany we obviate the irksomeness of military duty by making people serve in their native towns or provinces, and granting them liberal furloughs if their personal circumstances seem to demand it. But will the French Government dare to keep recruits in their native towns, and permit them to attend to their domestic business several hours in the day, whenever they can be spared from duty? Will garrisons be stationed in University towns for the express purpose of giving students an opportunity of acquitting themselves of their military obligations without interrupting their studies? No French

Government can afford to accord these privileges. The Paris garrison have just been forbidden to accept volunteers from the capital, and, which is a more general measure, to protect the troops from the demoralising influence of the population, a large portion of the standing army is to be stationed in permanent camps. It is hardly too much to say that to introduce universal conscription in a country where such precautions are necessary is an absurdity. In Germany, although the principle of universal conscription has sunk deep into the heart of the people, and is highly prized by the nation at large, to propose measures such as are now contemplated by the French Government would raise an outcry throughout the land. Are the French more willing to undergo the additional hardships devised for them by their Government than the Germans? Are French recruits, taken from all classes, really disposed to divorce themselves entirely from all intercourse with civilians? We do not think that those classes hitherto exempt from the conscription will be found to possess the self-denial requisite to endure these privations; and even if these were not so, even if the educated classes of France were less luxurious and selfish than they are, we should doubt whether their joining the army would add to the military strength of the country. However much the army may be benefited by the smart intelligence of the cultivated Gaul, those strata of society blessed with this precious boon are the very classes in which the sense of duty and self-abnegation is all but extinct, and vanity and selfishness are paramount. Intelligence without strict morality, in our opinion, is more likely to poison the army than to ennoble it. And while this new dangerous element is added to the military *cadres*, while, to make bad worse, the Communistic population of the large cities are likewise draughted into the army, the term of service is shortened by several years, and the substitutes, so long the most reliable ingredient of the rank and file, are being done away with entirely and at a moment's notice.

"After what we have said it is superfluous to remark that the discipline of the army will not be improved by these rash innovations, and that in domestic complications in the future it will be even less reliable than it was. If for many years past no French Government could depend on the fidelity of their troops in a political crisis, but many Administrations were, on the contrary, subverted by those who ought to have been their military guardians—if, we say, these untoward incidents have shown themselves before the introduction of universal conscription, what will it be hereafter? A Frenchman is easily carried away by the impressions of the moment, and the many revolutions that have visited the country during the last eighty years, have too grievously impaired the sense of duty and fidelity which formerly pervaded the nation to have left the feelings and discipline of the army uncontaminated. By universal conscription this political poison, which has hitherto been doled out to the army in small doses only, will now be communicated to every battalion, and infect the whole body with the terrible gangrene. We

shall soon see all parties vie with each other in gaining the favour of the army; and as all will have their representatives in the ranks, all may hope to succeed to some extent. If the standing forces are sure to be demoralized in consequence of these, the large number on furlough under the new system will be even more liable to the deleterious influences inseperable from party strife in a revolutionary country.

"The only resistance that can be offered to these evils must proceed from the officers. In a country where universal conscription prevails, military officers occupy a very different position from that held by their equals in rank in other lands. In such a country military officers are the teachers, the educators of the entire nation. All young men pass through their hands. All have to be taught not only to fire a rifle and to move in squads, but also to behave respectfully to their superiors, and to acknowledge the necessity of orders and obedience in executing a common purpose. Again, while the rank and file are constantly changing, the officers are the only stable element in an army of this description. They are the only element permanent in the regiments, the only ingredient in the military system capable of handing down the tradition of soldierly virtue and inspiriting memories. They are the only basis on which discipline and a martial spirit can be built up. The impression produced by their behaviour upon the private must be strong enough not only to render discipline an easy yoke during his time of service, but also to last through the many years he continues in the reserve. Unless the effect produced upon the soldier by the bearing of his regimental officers be deep enough not to be erased in after life, the country, if obliged to call out the reserve, cannot depend upon the citizen warriors, to whom its safety is mainly intrusted. It is only if a soldier on furlough remembers the experience of active service sufficiently well to preserve in civil life the orderly habits he has acquired while under arms, that he will be an efficient man when called in, and also teach his children and neighbours how to serve the country in a methodical and patriotic way. To educate the rank and file for this national object is the task imposed upon military officers under the rule of universal conscription. To fulfil it requires no little knowledge, character, and sense of duty. If a man is to educate a fresh batch of recruits year after year, he must have an earnest mind and a devotion to the service, which few French officers have hitherto shown. Our officers have long realized the truth, that to maintain their authority, their culture must be equal to that of the most educated portion of the rank and file, and the discharge of their military duties so punctual as to command the respect of each and all. To perfect their military acquirements and give an example of moral conduct, therefore, became a necessity of their position. They could not have held their own without this. With this arduous course of life we will not compare the ordinary career of a French officer; but that it was a widely different thing will not be denied. A large proportion of French officers were men without any general culture, men who had risen from the ranks, without any merit but that

of possessing a certain routine of the most elementary kind. In the present tone of the French mind, it would be dangerous to do away with this questionable kind of promotion, even if the necessary number of educated men could be found to fill up vacancies. Under any circumstances, it will be absolutely impossible to organize a body of officers which shall be welded into a compact whole by a due appreciation of military and patriotic duty, and which shall brave the obstructive influences of party life with the shield of personal and knightly honour. The formation of such a body of officers can be the result only of long and inspiriting traditions in a monarchical State. It cannot be accomplished without many a successive generation of cadets being imbued with the same unswerving spirit, by a strong and uniform will; it cannot be accomplished without the recollection of the past linking itself in an unbroken chain with the experience of the present.

"Ever since a Prussian army has risen into existence, its officers have known no policy except that of uncompromising devotion to the King. To him who is raised above all our eyes have been ever directed. With our officers, faithfulness to the King and patriotism have been always one and the same thing. Honour has been identified with duty and national pride with strict performance of personal obligations. At the time universal conscription was introduced this feeling had attained an intensity which no outward circumstances could diminish. Thus universal conscription has been the making of Prussia, and through Prussia of Germany.

"But what oath is sacred in France? Is the French officer to consider himself bound by the solemn promise he has given to the Orleans? Or does his sword belong to Louis Napoleon or to M. Thiers, or to M. Gambetta? Where in France is the strong hand that has educated and formed a body of officers capable of keeping the army together? And if a French General told us but the other day that in France patriotism makes up for all other wants, we beg to enquire what patrotism means in such a country? Is he the greatest patriot who subverts a Republic, or he who supports it? Does patriotism enjoin a man to lead back the Emperor, to reinstate Henry V., or, perhaps, to set up the Comte de Paris? Without unity of purpose, without intellectual power and moral strength, the French officers will never exercise such an influence over an army based upon universal conscription, as to restrain passions and inculcate those primary virtues of military obedience and cohesion without which an army is a peril rather than a blessing to any State.

"Universal conscription, such as we have it in Germany, can be beneficial only in States where the social machinery can bear rough wear and tear, and has stood the test of many a rude shock. But whoever introduces our military system into a land undermined by political factions runs the risk of breeding civil war. As the French, by their constant clamour for revenge, force us to note the weak points in their armour, we cannot but be gratified by the introduction of universal conscription by our unruly neighbours."

INVENTIONS.

I.

Rifled Guns.

In continuation of my remarks, *vide* page 105 No. 4 of Proceedings, U. S. I. of India, for the month of November last, I now beg to submit to the Council of this Journal, a description of the Gun with the following introductory remarks:—

"Rifling was first introduced in order to ensure a greater degree of accuracy in the flight of the spherical projectiles then in use; these being made of cast-iron, were subject to the following imperfections:—roughness of exterior, departure from the true spherical form, and want of homogeniety. The rotatory motion imparted to the ball, corrected these defects, but the initial velocity was lessened from increase of windage and friction; hence a shorter range. The adoption of elongated shot, provided with ribs or studs, to fit into the grooves, which followed shortly after, left nothing further to be desired on the score of range, as owing to their mechanical fit, smallness of diameter, and increased weight, little or no windage occurred, less atmospheric resistance, and greater penetration. That the spiral, or rotatory motion given to an elongated projectile, enables it to travel point foremost through the air for a long distance (length of the spiral, or velocity of rotation, varying with the length of the projectile) is correct, has been proved; but the judiciousness of rifling, or grooving out the bore of a gun, in order to impart this spiral motion to the shot, appeared to me very doubtful, indeed, apart from the consideration of increased weight of metal consequent on the above, and the severe strain due to a more rapid twist, in some descriptions, ensues the disturbance of the molecular forces in the metal of the gun; a point of no mean importance, though apparently ignored. It now occured to me, that the same "spin" could be given to these shot by the introduction of a "central rifled rod" which would leave the bore of the piece intact. This rod, or "axial rifled bar" round which the shot is accurately fitted, also meets another requirement, *viz.*, that of reducing the weight of the bolt to that of the spherical shot, as originally intended to be discharged from the gun; thereby obviating the necessity of reducing and strengthening the bores of the guns in store, before they could be used, as at present. This appeared to me to be of much importance in point of economy, as the fitting of rifled tubes, of steel, and wrought-iron, to new, as well

as to old ordnance, has not resulted satisfactorily. Recent experiments have proved the laws affecting the expansion and contraction of metals to be as immutable as ever, for the tubes, after long or rapid firing, become heated, and expand, whilst their outer coiled, or cast-iron coating, remaining comparatively cool, checks or bars their outward expansion. This process, therefore, must perforce take place inwardly, and does so, in the form of wrinkles or irregular corrugations, or else it splits or cracks the metal. The 35-Ton Woolwich Gun, on which so much care, labor and money has been expended, has proved no exception to this rule. I now submit a description of the gun and its projectiles, with colored drawing annexed.

"This invention has for its object the attainment of a longer and more steady flight of a shot or projectile, and consists in applying the projective force by means of an annular cartridge approximately to the centre of gravity of a hollow cylindrical projectile, instead of as is usual at the base; a rotatory motion being imparted to the projectile by rifling it internally. My projectile is in the form of a hollow cylinder, thus destroying the vacuum in the rear of the shot, and is of the same internal diameter throughout its length. At the centre of gravity, or as nearly as possible to such centre of gravity of the shot when complete, a shoulder is formed and the external diameter of the shot considerably enlarged; this enlarged diameter is continued for a short distance of its length. The diameter is then decreased, till it meets the interior diameter of the projectile, or it may be convenient to enlarge the interior diameter, till it meets the external diameter. The line formed by the reduction of the external or the enlargement of the internal diameter, may be either straight lines, or any curves suitable for the head of a projectile. This projectile is rifled for the purpose of receiving additional rotatory motion from a rifled rod, centrally disposed in the bore of the cannon, and is of the same diameter as the internal diameter of the projectile. The annular cartridge is disposed between the shoulder and the extremity of the projectile, and is ignited from the vent, in the usual manner.

DESCRIPTION OF THE DRAWINGS.

FIG. 1.—Is a longitudinal section of my projectile and gun. The shot being shewn in the position it occupies, previous to the discharge of the gun. Upon a hollow cylindrical shot, and at the centre of gravity, or as nearly as possible to such centre of gravity, of the shot, when complete, the shoulder (A) is raised, and the external diameter of the shot enlarged to fit the bore of the gun. The head thus formed may be pointed in any suitable curve, or tapered inter-

nally and slightly externally as shown in section in the gun. At the extremity of the bore of the cannon or gun (C) a rifled rod (B) rises, of the same diameter as the internal diameter of the projectile. The cartridge (E) is disposed between the shoulder (A) and the base, and may be fired in any convenient manner.

FIG. 2.—Is an elevation of the projectile, shewn in section, at Fig. 1.

The following are the advantages that I claim for my Invention :—

1*st.*—Applying the projective force to the centre of gravity of a hollow cylindrical shot, in lieu of at the rear end of the projectile.

2*ndly.*—Flatness of trajectory, and greater initial velocity, the shot meeting with less atmospheric resistance. The air passing through the centre of the projectile, there can also be little or no vacuum in its rear.

3*rdly.*—The rifling which imparts the rotatory motion to the shot, being placed on a central rod, instead of, as is usual, by grooves in the bore, the gun does not become unservicable, or useless from the wear of the grooves, after heavy firing, as, by my system, a fresh rod or bar has only to be introduced, to make the piece as effective as before.

4*thly.*—The economical and ready convertibility of smooth-bored ordnace, old and new, into rifled cannon.

5*thly.*—The ready re-conversion of a gun, rifled on this system to its normal condition, by the simple but effective process of removing the rifled rod, and the fitting in its place, of a screwed plug, enabling shrapnell, grape, cannister, etc., to be fired on advancing bodies of Troops.

6*th.*—From these guns may also be projected my "shell war rockets," by the removal of the screwed plug, and the filling up of the thread of the screw with a "bush."

In conclusion, I have to add that the 2-pounder bronze gun, mentioned in my concluding remarks, page No. 105 of Proceedings U. S. I. of India, for November last, has been tried at the Artillery Range, Dum-Dum, and has already furnished results so satisfactory and remarkable as to induce me to believe that further experiments will be found of so important and decided a character as to render it in future, by reason of its simplicity and economy, a most important auxiliary in modern warfare.

ADDINGTON TAYLOR, MAJOR,
8th Regiment, B. Native Infantry.

P. S.—Some time I am afraid must elapse before I can lay before the Council the results of these experiments. Time and opportunity being wanting just now.

A. T.

II.

On Punkah-pulling by Machinery for Barracks in India.

To THE SECRETARY OF THE UNITED SERVICE INSTITUTION OF INDIA.

SIR,—As requested by you, I have the honor to forward my invention of improvement in punkah-pulling for Barracks in India.

The simplest way of doing this is by giving you an account of the experiments made at Roorki, under Colonel Maunswell (Superintendent for the Ventilation of Barracks in India).

I went to Roorki, on application, at my own expense, to lay before the Committee my invention, and got leave from the General commanding my Division.

Before going to Roorki, I built a complete model, consisting of the fly-wheel (as shown in the Plate) and 72 model punkahs with everything correct, *viz.*, 3 Barrack rooms containing 24 punkahs each. The Barrack rooms were in a line, but the third at right angles to the two.

When I got to Roorki, the Committee were so much pleased with the model, that they sanctioned its trial in full size, which I am sorry to say was not so successful, owing to several hindrances.

1*st*.—The fly-wheel was cast in a hurry.
2*nd*.—The stand for the fly-wheel was not strong enough.
3*rd*.—The bearings not properly made for the axle.
4*th*.—The cranks not properly secured to the axle.

The result was, that in turning the wheel when the punkahs were attached to the axle it jerked them more than was necessary. But in spite of all these grievances I managed to pull 42 of 15 feet and 11 of 22 feet punkah, making altogether 64 small punkahs of 15 feet in length.

The machinery was placed at the end of one of these Barrack-rooms parallel to each other, which necessitated the pulling of the punkah round three corners.

I succeeded in pulling these 64 punkahs with one coolie, who found it rather hard work on account of the machinery being so bad, but still he pulled them, giving them a swing of 6 feet 7 inches; whereas four coolies, without the wheel, could scarcely move them and only gave them a swing of 4 feet 6 inches.

I believe, to the best of my memory, that this is correct, but, the Committee not having sent me in a report of any kind, and it being nearly two years ago since I brought it before them, I could not swear to it being perfectly correct.

The machinery is very simple, and consists of an iron fly-wheel, 9 inches in diameter, weighted at an angle of 60 degrees to the crank, (as shown in the Plate). This wheel is simply turned round by a coolie (which I would recommend as the motive power for up-country, when the Barracks are scattered, but in large places, where the Barracks are close together, I would recommend steam). Of course. immediately the weight loses its centre of gravity, it pulls the punkahs, and when the weight is at the dead point at the bottom, the punkahs being their full pull, bring up the weight again to its former position.

The thing of most importance, remarked by the Ventilation Board, in my invention was, that I had imitated the "*motion of the punkah coolies arm*," which has always been wanting in similar former inventions.

In fact, if the spectator did not know any thing of the wheel, he would not doubt for a moment that a *very good* coolie was pulling the punkahs.

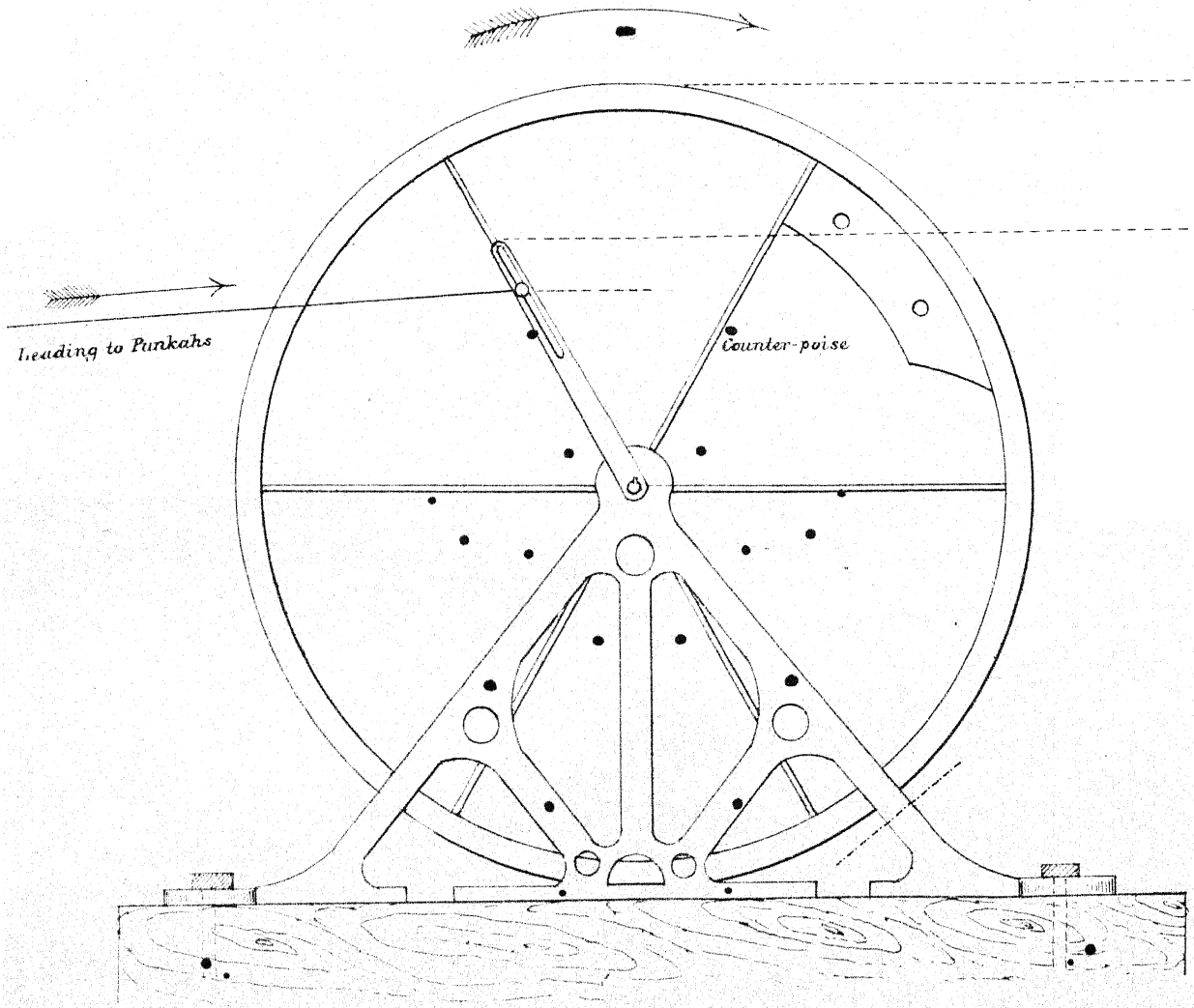
With steam I could pull the whole of the punkahs in Fort Willlam with a 2-horses-power engine. The only expense my invention would necessitate to Government would be a "Trained" Sergeant paid and told off for simply looking after these fly-wheels, and keeping the machinery in order, and in large places a man to look after the steam engine. The machinery, as may be seen, is very cheap, simple, and, when in motion, noiseless.

The advantages gained by my invention are as follows :—

I. Less natives are about Barracks, and, therefore, bring less disease among the men. I have heard medical men say very often, that most epidemics are the result of a multitude of natives that are allowed about Barracks, that they bring sickness with them out of cities and bazars. Also, it makes the men lazy, they get every thing done for them, and, therefore, get no exercise, and sleep all day. (Sic. Ed.)

II. The punkahs cannot stop because the coolie cannot; the wheel once started the coolie must go on, he would be knocked down if he went to sleep. This prevents the soldier from getting chilled or fever. By this I mean, that with the present system the soldier goes to sleep with a good swinging-punkah, after a time the coolie does the same, the punkah stops, and the man breaks out into perspiration, the coolie wakes suddenly, begins to pull violently, of course checks the perspiration and gives the man fever.

TURNBULL'S BALANCED FLY WHEEL FOR WORKING PUNKAHS IN BARRACKS &C



Scale ½ Inch = 1 Foot.

Litho. at the Survr. Genl's. Office, Cal. March 1872

III. The punkah pulls all through at the regulated swing. That is to say, if the arm of the crank is 3 feet long, the punkahs must be pulled 6 feet, and the coolie cannot pull less if he tried.

IV. With this wheel the punkahs can be pulled with three different powers.

1*st*.—Hand power, (coolie.)
2*nd*.—Steam do.
3*rd*.—Water do.

By water I mean in a station like Peshawar where the water runs through the station. I must conclude by saying that if you would only sanction me to rig up Fort William in Calcutta with steam, I would save them a considerably large sum the very first year, and also prove my invention beneficial to the health of Troops.

If required, I can also send some drawings showing an improvement in slinging, connecting, and pulling punkahs round corners.

I have the honor to be, Sir,
Your obedient Servant,
H. TURNBULL, LIEUT,
6th Regiment.

Copy of a Letter from the late Hon'ble Archdeacon Pratt, dated Murree, August 16th, 1872.

MY DEAR MR. TURNBULL,—When I saw your model of a machine for pulling punkahs I was struck with the simplicity and apparent efficiency of the weight on the wheel for giving the jerk, which is so essential to the good working of a punkah. But as it was only a model I saw, I do not feel able to give a decisive opinion on the machine itself. I should very much like to see the machine itself at work, but that I fear is impracticable, as in my travels I am not going any where where it is set up.

The only real fear I had, that it might not work except by hand, you have removed by explaining in what way the steam engine is to act upon the machine.

It appeared to me that though a man's arm would have a certain amount of play in it to allow the weight to have its action in giving an impulse to the wheel and the jerk to the punkah, an ordinary double-acting steam-engine would subdue the whole motion to a uniform one. But this objection you entirely remove by saying that the steam-engine is only to lift the weight; that is, if the wheel and weight are afterwards to be left free to move faster than when the weight is ascending, and not be impeded by any connexion of the wheel with the engine in any way.

I am, Yours very truly,
(Sd.) J. H. PRATT.

TO LIEUT.-TURNBULL,
6th Royals.

III.

The Heliograph or Sun Telegraph.

TO THE SECRETARY OF THE UNITED SERVICE INSTITUTION OF INDIA, AT SIMLA.

KURRACHEE, 10*th February*, 1872.

DEAR SIR,—It struck me that a little information on the *Heliograph* might be interesting to the service, and as I cannot but think so simple a method of conveying communication between different Posts and Positions will surely be adopted, particularly in India's sunny clime, I asked Mr. Mance, of the Indo-European Telegraph Department, (to whom the entire credit is due for so simple a contrivance) to favor me with a brief description of his Instrument and the manner of working it. He most obligingly complied, and I have now the pleasure to forward the same for the consideration of the Council, with a view to its being published.

The subject has already been brought to the notice of the Bombay Government and His Excellency Sir A. Spencer, and is considered so well deserving of consideration, that a party of two officers and six non-commissioned officers and men of the 66th Regiment were placed at Mr. Mance's disposal for the purpose of being instruced in the use of the Instrument: and they have now left Kurrachee, in charge of a pair of the Instruments, to join the Army Signalling Department at Poorundhur near Poona, where it will be fairly tested.

As at present constructed they have been found to answer better at 15 miles than 5—the flash being more subdued and less trying to the eyes—but Mr. Mance informs me that there is no doubt the Instrument could be slightly modified for different descriptions of work if it should be adopted for Army Signalling. The spare mirrors recommended in Mr. Mance's penultimate para. were not sent with the party to Poona, as it was thought scarcely worth while going to additional expense unless Government decided to go on with the matter.

Yours faithfully,

W. BLAKE, LIEUT-COL.,

Commandant, 1st Belooches.

THE HELIOGRAPH OR SUN TELEGRAPH.

Although the fact of the flash from a mirror being visible for many miles appears to have been known for more than a thou-

sand years, no advantage has been taken of the circumstance beyond using it to direct the instruments employed in taking the bearings of remote points during extensive surveys. Strange to say that although the desirability of being able to communicate at such times with the distant station must have been very great, no effort appear to have been made to this end, although the form of the Heliotropes might easily have been changed and adapted for the purpose.

I believe I am correct in stating that the Morse Telegraph Alphabet was first used in connection with this flashing light system in 1869 at the Jask Telegraph Station. We were thus enabled to converse with tolerable facility between points fully 8 miles apart. Recently however, better Instruments have been constructed and experiments made—the result being to shew the ease with which communication can be established over much greater distances (20 miles) at a speed exceeding ten words per minute.

The weight of the Instrument is about equal to that of a regulation musket—with the legs screwed on in readiness for working it rests conveniently on the shoulder, and can easily be carried by one person—in field service, it would, of course, be necessary that each Instrument should be attended by a party of two or three, but at a permanent station, where glasses of a larger size (12 inches in diameter) might be used, one signaller only would be required. After a few days' practice any telegraphist of moderate abilities, should be able to work it.

The Instrument can be set up ready for working in two or three minutes, and in the event of there being any other signalling party within range, their attention can be attracted by directing the flash towards the spot at which they may be expected—5 minutes are usually sufficient to establish communication.

It may be argued that this system could only be relied on during sunny weather, but it should be understood that it is only advocated as an auxilliary to other systems of Field Telegraphy—it would come into operation at distances when other methods are useless or tediously slow—in cheapness, range, and portablity it does not compare unfavorably with existing systems of signalling, and there is no doubt that, in competent hands, it would prove an important acquisition during an Indian campaign.

The flashes are invisible to any one placed far to the right or left of the direct line, so that, from elevated points far distant, communication could be kept up with a fortress without the beseigers having any suspicion of the fact.

The adjustments necessary to keep the reflection of the sun in the same line and in view of the distant observer are similar to those

required in the Heliostat, such absolute precision is, however, unnecessary, an occasional turn of the screws at brief intervals being found sufficient to keep the flash in the right direction, a small lever similar to the simplest form of a telegraph key is attached to the base of the Instrument and connected to the rim of the mirror by a brass-rod, the length of which is regulated by the handle of the key. The long or short flashes representing the bars and dots of the Morse Alphabet are produced by the depression of the key for a longer or shorter period.

It is desirable to supplement each apparatus with an additional mirror with a light stand, as, in the first place, the spare glass would provide for accidents, and, secondly, it would enable the signallers to work with greater ease, should the sun be behind them and nearly in a line with the two stations. In this case the spare mirror faces the distant station, and the flashes are directed into it by the signalling glass, which is removed a few feet in advance and turned completely round so as to receive the full rays of the sun.

KURRACHEE, *7th February* 1872. HENRY MANCE.

Detailed instructions for working these Instruments accompanied the pair sent to Poona, with the party under Lieut. Stevenson, 66th Regt., a young officer who took great pains in mastering the subject.

W. B.

INDO EUROPEAN TELEGRAPH DEPARTMENT.

No. 869 OF 1871.

Kurrachee 17th November 1871.

FROM THE DIRECTOR MEKRAN COAST AND SUB-MARINE TELEGRAPH,

TO COLONEL SIR W. J. MEREWETHER, K. C. S. I. & C. B,
Commissioner in Sind.

SIR,—I have the honor to forward for your information copy of a Memorandum by Mr. Mance, the Superintendent of our Kurrachee Station, detailing the construction and mode of using the Heliograph or Sun Telegraph the working of which you did me the favor of coming to witness.

2. Since the date of Mr. Mance's Memo. I sent Assistant-Superintendent Mr. Sealy and one clerk across the frontier to a high part of the public range of hills 21 miles from the Office with a view to ascertain how far it was practicable to read the signals from the

Heliograph, and I found that at that distance I could myself read from 12 to 14 words per minute, and I fully believe that at 40 miles distance the signals would be as readily understood. The inter-communication at 21 miles was perfect.

3. I have shown the instrument to General Addison and his staff, as well as to many officers at this station who would doubtless be glad to give the result of their experience, and I should esteem it a great favor if you would kindly represent to Government your opinion of the uses that might be made of the Heliograph, which is particularly suited to the generally unclouded state of the sky in this province.

I have the honor to be &c.,

(Sd.) H. I. WALTON,

Director, Mekran Coast and Sub-Marine Telegraph.

MEMO. ON THE HELIOGRAPH OR SUN TELEGRAPH.

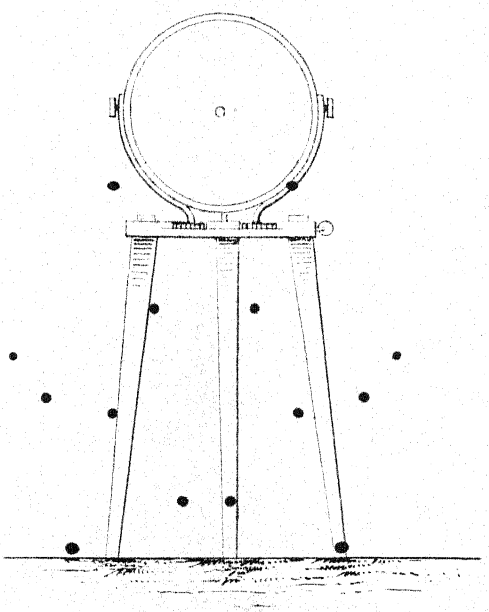
Although the fact of the flash from a mirror being visible for many miles, appears to have been known for more than a thousand years, no advantage has been taken of the circumstance, beyond using it in the Trigonometrical Survey when taking distant bearings or sending intermittent flashes of sun light by means of revolving mirrors for the guidance of ships when entering ports.

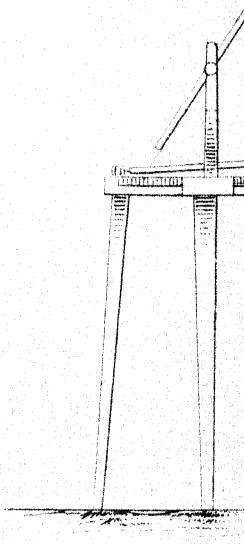
The instruments used by surveyors enable them to transmit flashes of reflected light between stations 50 miles apart from each other, but, although the desirability of being able to communicate at such times with the distant observer must have been very great, strange to say no effort appears to have been made to this end, although the form of the Heliotrope might have easily been changed and adapted for the purpose.

I believe I am correct in stating that this was done for the first time in the autumn of 1869 at the Jask Telegraph Station, where it became part of my duty to conduct some practice with the lamps used for signalling by night. Parties were formed, who proceeded to a village about 9 miles distant across the bay, and, on one of these occasions, a looking-glass was taken to see if the flashes were visible at that distance; they were found to be perfectly distinct but too intermittent to be made use of for Telegraph purposes.

At the conclusion of the experiment the distant glass, by a lucky chance was left leaning against the side of the hut, and, about half an hour afterwards, my attention was drawn to the fact, by a faint gleam of light, which gradually increasing in briliancy as the image of the sun became more fully reflected gave back a prolonged flash so

THE HELIOGRAPH OR SUN TELEGRAPH.





Height of Stand 3 feet 6 inches.

Diameter of Mirror 3 inches.... (12 inches for distances over 20 miles.)

Lith: at the Surv: Gen^{l} office, Cal: 1877

dazzling and steady, that I was at once convinced of the possibility of using a system of long and short flashes analogous to the dashes and dots which compose the Morse Telegraph Alphabet.

Instruments of rude construction were at once made by myself and Mr. Sealy, the Assistant-Superintendent, who throughout the experiments has always taken the greatest interest in furthering the development of the idea. Such Instruments, however, as we were able to construct, were necessarily very imperfect, they were nevertheless sufficiently effective to demonstrate the possibility of exchanging messages over a distance of 8 or 9 miles—a distance which I have no doubt will be exceeded when using the far superior Instruments which have just been constructed in the workshops of this department.

The adjustments necessary to obviate the constantly changing angle of incidence are very similar to those required in the Heliostat and Equatorial Telescope. Such absolute precision, however, is unnecessary, an occasional turn of the screw at brief intervals is found sufficient to direct the flashes in the true line. A small lever similar to the simplest form of a telegraph key is attached to the base of the Instrument and connected to the Mirror by a brass rod, the long or short flashes representing the bars and dots of the Morse Alphabet being rendered by the depression of the key for a longer or shorter period.

It would be very desirable to supplement each apparatus with an additional mirror on a light stand, as, in the first place, it would provide for accidents, and, secondly, it would enable the signaller to continue working should the sun be nearly in a line with the two stations and near the horizon.

Hitherto we have never resorted to the second glass, but there is no doubt its use would sometimes be of great service. Even with the additional mirror it would still admit of being easily carried and managed by one person, and after a few days practice any telegraphist of moderate ablities should be able to work it.

The Instrument can be set-up ready for working in a few minutes, and in the event of there being any other signalling party within range their attention can be attracted by directing the flash towards the spot at which they may be expected, 5 minutes being generally sufficient to establish communication. The object of the various adjustments is so obvious that it will scarcely be necessary to describe it at further length; it will perhaps be sufficient to say that with our present practice, which has been limited to four occasions, we have been able to transmit freely and accurately at the rate of 10 or 12 words per minute between points five or six miles distant. I have no hesitation in stating that in a few days we shall work through 4 or 5 times that distance.

It might be argued that this system could only be relied on during sunny weather, but it should be understood that it is only advocated as an auxilliary to the night lamps. The sun telegraph would come into operation at distances where all other system are useless or tediously slow. In cheapness, rapidity of communication, range and portability it will compare favorably with existing systems of signalling, and there is no doubt that in proper hands it would prove an important acquisition during an Indian campaign.

Should you consider it desirable to obtain further proof as to the utility of this method of signalling, and authorize the construction of one or two additional instruments, the whole country for 20 miles round Kurrachee might be placed in communication with the general commanding the station within a few hours after receiving intimation of his wishes to that effect.

(Sd.) HENRY MANCE,
Supdt. in charge Kurrachee Station,
Indo-European Telegraph Department.

KURRACHEE; *6th November* 1871.

Forwarded for the information of H. J. Walton, Esq. Director, Mekran Coast and Submarine Telegraph Department.

(Sd.) HENRY MANCE.

No. 805 OF 1871.

FROM COLONEL SIR W. J. MEREWETHER, K. C. S. I. & C. B.,
Commissioner in Sind.

TO HIS EXCELLENCY THE RIGHT HON'BLE
SIR W. R. SEYMOUR V. FITZGERALD, G. C. S. I.,
Governor and President in Council, Bombay.

COMMISSIONER'S OFFICE,
Camp on the Indus, 8th December, 1878.

RIGHT HON'BLE SIR,—I have the honor to forward herewith copy of a letter from Mr. Walton, Director, Mekran Coast and Submarine Telegraph, communicating a Memorandum by Mr. Mance, Superintendent in charge Kurrachee Telegraph Station, on a very simple Instrument cleverly contrived by that gentleman for the use of the sun's rays in telegraphy.

2. The Instrument is merely a common glass mirror fixed on a tripod stand with horizontal and vertical adjusting screws, and used to flash the sun in somewhat the same manner as the Heliotrope worked in the Trigonometrical Survey. Two of these mirrors placed at required distances are brought into exact adjustment so as to send a steady direct flash. To the base of the Instrument, as directed by Mr. Mance, a small lever similar to the simplest form of a telegraph key in attached, connected to the mirror by a brass rod, and by the depression of this key for a longer or shorter period long and short flashes can be given representing the bars and dots of the Morse Alphabet.

3. Mr. Walton was good enough to show me trials of this Instrument twice, once at his own office, and again from Government House, the opposite mirrors being both times at Manora, a distance of between 5 and 6 miles. The relative position of the mirrors was found without the least delay the bright flash showing this. Immediately chance messages were sent backwards and forwards, and on all occasions were read straight off without the necessity of any repetition.

4. I cannot but think that this would prove a most invaluable aid to Military Telegraphy. It has been used successfully by Mr. Walton for a distance of 21 miles, and there is every reason to believe that messages may be equally well transmitted for 40 to 50 miles. In most parts of India, where the sun is generally bright for the greater part of the day, it would be employed with great advantage.

4. Mr. Walton has unfortunately omitted to mention the cost of each Instrument, but I believe I am correct in saying that it can be made up in any workshops for 30 or 40 rupees.

6. The School of Telegraphy, which is now assembled in the Deccan, would be an excellent place to test its merits, and if your Excellency so desired it, I could easily get two such Instruments made up at the Telegraph workshops, and Mr. Mance would be ready at any time to teach two or three non-commissioned officers, if General Addison were allowed to select them from the European Regiment at Kurrachee. These, when proficient, might be sent to the Deccan with the Instruments to have them thoroughly tried, and to teach other men there.

I have the honor to be &c.,

(Sd.) W. L. MEREWETHER, COLONEL,
Commissioner in Sind.

Army Telegraphy.

Military Department.
No. 391

Bombay Castle,
23rd January 1872.

Letter from the Commissioner in Sind, No. 805, dated 8th December 1871.

Forwards a letter from Mr. Walton, Director, Mekran Coast and Sub-Marine Telegraph, submitting a Memorandum by Mr. Mance, Superintendent in charge Kurrachee Telegraph Station, on an Instrument contrived by him for the use of the sun's rays in telegraphy. States that in his opinion this Instrument would prove a most invaluable aid to Military Telegraphy, and that the School of Telegraphy, which is now assembled in the Deccan, would be an excellent place to test its merits.

Report by the Quarter Master General of the Army, No. 16-11—109, dated 6th January 1872.

Report by the Controller of Military Accounts, No. 76, dated 16th January 1872.

RESOLUTION—Two Instruments may be supplied to the School of Telegraphy at Poona.

The Government of India to be informed.

Major-General,
Secretary to Government.

To

THE COMMISSIONER IN SIND.
THE QUARTER-MASTER GENERAL.
THE CONTROLLER OF MILITARY ACCOUNTS.

Army Telegraphy.

Military Department.
No. 392

Bombay Castle,
23rd January 1879.

Telegram from the Director, Mekran Coast Sub-Marine Telegraph, dated 23rd January 1872.

"Letter (805) dated 8th December, from Commissioner Sind. I am sending two Heliograph Instruments to Army School of signalling. Two officers of 66th going, have *not* had sufficient time to learn use of Instrument. Would recommend officer of this Department being sent for one month by same opportunity to teach system. Steamer leaves Friday morning."

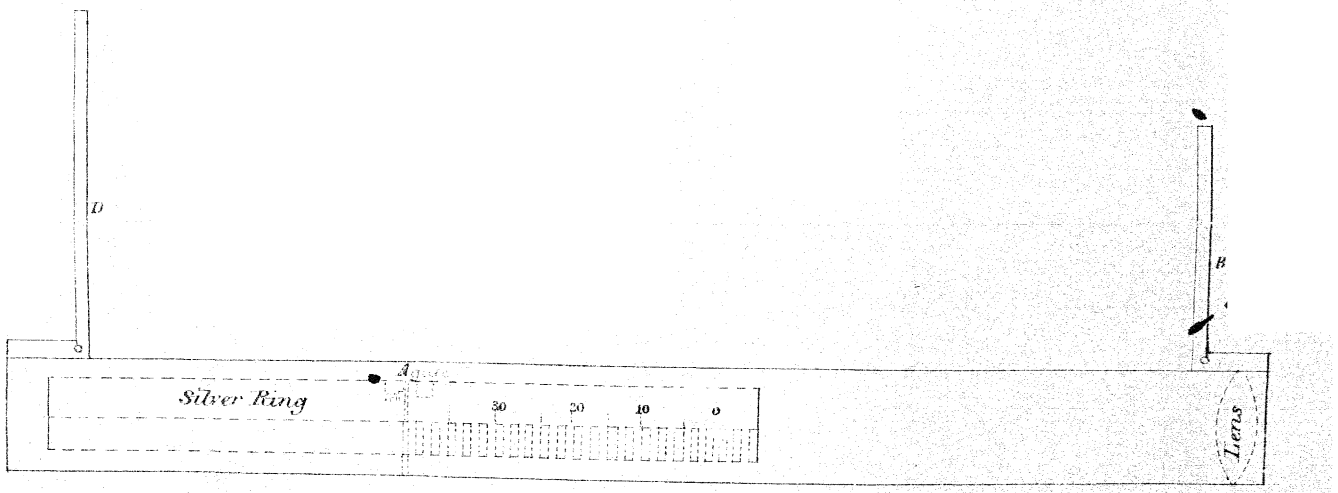
RESOLUTION—The Quarter-Master General to be asked by telegraph to detain one of the officers alluded to in Mr. Walton's telegram until he has become thoroughly acquainted with the use of the Heliograph.

Major-General,
Secretary to Government.

To

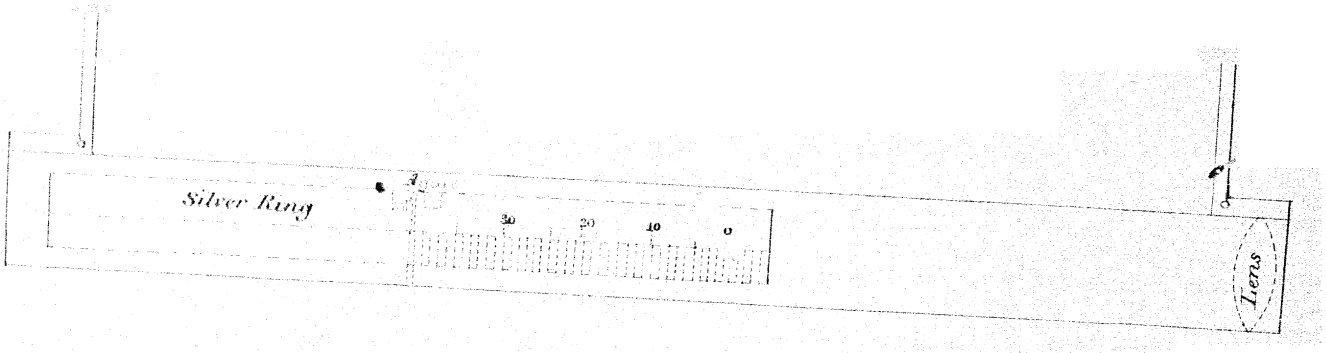
THE DIRECTOR, MEKRAN COAST AND SUB-MARINE TELEGRAPH.
(With copy of Government Resolution No. 391 of this date)
THE QUARTER MASTER GENERAL.
THE CONTROLLER OF MILITARY ACCOUNTS.
THE COMMISSIONER IN SIND.

NOTE.—There is nothing very novel in the use of the Heliostat for flashing signals. The Russians had a semaphore of this description at Sebastopol on the north side of the harbour, and Mr. Galton describes a neat little portable Heliostat for use in the field in his "Art of Travel," 3rd Edition, pages 150 to 153, but Mr. Mance deserves much credit for the simple mechanism which has converted it into a Telegraphic Instrument, and the application to it of the "Morse" Alphabet, and we trust it will be speedily introduced in this country as a supplementary means of signalling in the Field.



SKETCH TO ACCOMPANY CAPTAIN J. M. TROTTER'S LETTER No. 1 (CORRESPONDENCE) IN No. V.

Litho. at the Survr. Genl's. Office. Cal. March 1872



SKETCH TO ACCOMPANY CAPTAIN J. M. TROTTER'S LETTER No. 1 (CORRESPONDENCE) IN No. V.

Litho. at the Survr. Genl's. Office. Cal. March 1872

CORRESPONDENCE.

I.

Sketch of a Surveying Compass.

To The SECRETARY of the UNITED SERVICE INSTITUTION of INDIA.

Sir,—The accompanying is a sketch of a Surveying Compass which I have recently had constructed by an instrument maker in Edinburgh, from a French pattern, which although extensively used by military surveyors on the continent, and considered by them an improvement on the Prismatic Compass, is not, I think, generally known in our service. Its construction is so simple that it is hardly necessary to supplement the sketch with a written description. The magnet which is 4 inches in length is attached to a graduated silver ring revolving on a pivot, and is contained in a case of the shape shewn in the sketch, made throughout of thin beaten silver, with the exception of a small portion (A C) which is occupied by a plate of of horn, or similar transparent material, somewhat smaller than the glass in Hutchinson's Prismatic Compass.

The instrument which I am describing is lighter than any Prismatic Compass with magnet of the same length, and has obviously the advantage of being stronger and less liable to injury than the compass in general use.

In taking a bearing the instrnment held at a distance of from a foot to eighteen inches from the eye is directed on the object in the usual manner by means of the slit B, and the hair in the sight vane at D. The bearing is then read through then lens E. F. The figures on the graduated ring as seen through the lens appear larger and are more easily read than those of a Prismatic Compass, and the position of the hand, at half arms length, will I think be found more favorable to steady observation than that necessiated by an instrument which has to be applied closely to the eye.

I am, Sir,

Yours obedient Servant,

J. M. TROTTER, Captain,

Bengal Infantry.

Books wanted to purchase.

THE BRITISH INDIAN MILITARY REPOSITORY, edited by Captain S. Parlby, Bengal Artillery, Vol. V. and following Vols. or Nos. 8vo. 1826.

THE EAST INDIA MILITARY CALENDAR, 3 or more vols 4 to, published about 1832-35.

DODWELL AND MILES "ARMY LIST," of the three Indian Armies, large 8vo., date unknown.

JAMES' MILITARY DICTIONARY, thick, 8vo., date unknown.

MULLER'S SCIENCE OF WAR, 3 vols. 8vo., date unknown.

WELSH'S MILITARY REMINISCENCES, 2 or 3 vols? 8vo., date unknown.

MEMOIRS OF GENERAL SIR R. GILLESPIE, 1 vol., 8vo.

MEMOIRS OF JOHN SHUPP 3 vols., 8vo.

Particulars of Price, Conditions, &c., to be sent to the SECRETARY, United Service Institution of India, at Simla.

NOTICES.

1. It is earnestly requested that Members of the Institution, who have not already paid their donation and subscription for 1872, will do so at their earliest convenience. Officers who may wish to become Members, are requested to be kind enough to forward their donations and subscriptions at the same time as they express a wish to join the Institution.

2.—Members changing their residence are requested to give early intimation of the same to the Secretary at Simla, and also to the Corresponding Members (if any) of the Station they are leaving and going to.

3.—Members going to England are requested to give an address in India where their Journal may be sent, and to note that their subscription is due on the 1st May in each year.

4.—Members are invited to become Corresponding Members at the different Stations. The duties of this office will be to collect subscriptions, forward papers, arrange about lectures and debates, and to communicate on general matters with the Council.

5.—The attention of those who intend to contribute to the Journal is called to the Rules on the subject.

6.—Members who may be willing to give their services for the translation of papers on Military subjects from foreign languages, are requested to communicate with the Secretary naming the language which they offer to translate.

7.—The attention of those who are working out inventions of Military importance is called to the opportunity afforded by the Journal of the Institution of making their ideas known. All inventions forwarded for publication (subject to the approval of the Council) will be carefully illustrated and described.

The following is published for general information :—

Revised Regulations of the United Service Institution of India.

I.—The Institution shall be named "The United Service Institution of India.

II.—The design of the Institution shall be the promotion of Naval and Military Art, Science and Literature.

III.—The proceedings of the Institution will embrace—

1. The delivery of lectures at any station in India.

2. Debates on Military subjects at any station in India.

3. The publication of a journal, as often as practicable, containing (when procurable) matters arranged in the following order :—

   (*a*) Original papers on Military subjects which the author is unable or unwilling to deliver in the form of a lecture.

   (*b*) Reports of lectures with the discussion thereon.

   (*c*) Reports of debates with the discussion thereon.

   (*d*) Opinions of Members on matters published in former numbers.

   (*e*) Selections from the records of the Military Departments of India (by authority).

(*f*) Translations from foreign works of Military interest selected by the Council or sent by Members.

(*g*) Short notes on professional subjects.

(*h*) Notices of inventions of Military importance.

(*i*) Correspondence on professional subjects.

V.—Composition—

1. The following shall be solicited to be Patron and Vice-Patrons respectively ex-officio :—

PATRON :

His Excellency the Viceroy and Governor-General of India.

VICE-PATRONS :

His Excellency the Commander-in-Chief in India.
" " of Madras.
" " of Bombay.
" " of Royal Navy on the Indian Station.

2. Besides the above, Vice-Patrons shall be limited to members of the Royal Family, Officers distinguished for their services, and Members who have been benefactors to the Institution.

3. All Officers of the Royal Navy and Army and of Volunteer Corps in India shall be entitled to become Members on payment of the entrance fee and annual subscription.

4. Gentlemen, not included above, may become Members on the recommendation of two Members of the Institution, and with the approval of the Council.

V.—1. The Government of the Institution shall be vested in a Council at the Head-Quarters of the Army in India, to consist of not less than 12 Members or more than 24, to be, as generally as possible, representative of all branches of the Forces in India. The names of Officers, willing to serve on the Council for each ensuing year, shall be published at least one month before the election, and all Members of the Institution, unable to attend, may record their votes for the Council by proxy.

2. One half of the Members of the Council shall go out annually by rotation, but all shall be eligible for re-election. Vacancies, occurring otherwise than by rotation, to be filled up provisionally by the Council.

3. Four Members of the Council will form a quorum, and the Senior Member will preside.

4. Officers will be invited to become Corresponding Members, to forward the objects of the Institution, and to communicate with the Council.

5. A Secretary shall be elected by the Council at the Head-Quarters of the Army in India for the purpose of (under the orders of the Council) keeping the accounts, editing the journal, and conducting correspondence, &c.

6. The duties of the Council shall be to exercise a general control over the welfare and expenditure of the Institution, and to pass papers for publication.

7. The Council shall frame such bye-laws, for the general conduct of the Institution, as may appear to them necessary, subject to confirmation by Members of the Institution at the next General Meeting.

8. The proceedings of the Institution shall be circulated annually for general information.

9. Non-Commissioned Officers and Soldiers of the Army and Volunteer Corps shall, when practicable, be permitted to attend meetings to hear lectures, &c., and the introduction of a member shall be sufficient to admit non-subscribers for the same purpose.

10. Secretaries of Serjeant's Messes and of Regimental Libraries and Reading Rooms can obtain the Journal of the Institution by paying in advance the amount of the annual subscription for each copy required.

VI.—An entrance fee of Rupees 5 shall be paid by Members on joining, and an annual subscription of Rupees 5 shall be paid in advance by the 1st of May each year.

BYE-LAWS.

Rules for Contributors to the Journal of the United Service Institution of India.

1. All papers must be written in a clear, legible hand, and only on one side of the paper.* All plans must have a scale on them.

2. Contributors may write anonymously, if they prefer to do so.

3. Unless the author expressly states at the end of his paper that he wishes it published complete or not at all, the Council will make such alterations in it as they deem necessary.

4. The Council do not undertake to authorise the publication of such papers as are passed, in the order which they may have been received.

5. Papers will be published, if passed by any four of the Council.

6. Contributors will be supplied with a few copies of their papers, provided they apply for the same before it is in the Press.

7. Contributors are requested, in future, to append a 'nom de plume' to their papers, in order that they may be communicated with in the "Answers to Contributors."

Rules for the Regulations of Meetings and Debates of the United Service Institution of India.

1. The subject of all lectures and debates must be submitted for the sanction of at least four members of the Council before they are held.

2. The Senior Member present, being an Officer of the Navy or Army, shall always officiate as Chairman at Meetings.

3. Speakers are requested to address their remarks to the Chairman, and not to the Meeting.

4. In the event of more than one Member rising to speak at the same time, the Chairman's decision as to who shall be heard first shall be final.

5. If called upon to do so by the Chairman, a speaker shall at once sit down.

6. No remarks of a personal nature, or in any way subversive of discipline or harmony, will be permitted.

7. Speakers are requested to arrange for notes of their own speeches being taken.

8. No interruptions will be permitted during the reading of a paper, or the speech of another Member.

* Special attention is directed to this rule, communications on both sides of the paper cannot be printed.

9. Meetings shall be broken up or adjourned only on the general vote of the Members present.

10. Non-Commissioned Officers and Soldiers of the Army, and Volunteer Corps shall, whenever practicable, be permitted to attend meetings to hear a lecture, and the introduction of a Member shall be sufficient to admit non-subscribers for the same purpose.

LIST OF SUBJECTS ON WHICH PAPERS ARE DESIRED.

On the organisation of a Transport Department for the Army in India.

On the organisation of an Intelligence Department for the Army in India.

On Military Telegraphy and Signalling adapted for service in India.

On the uses to which Troops, British and Native, can be put in aid of Government works.

On the organisation of Pioneer Companies in Infantry Regiments, and the more careful instruction of this branch in field works, &c.

On the future of Cavalry, as drawn from the teaching of the last three great wars.

On the distribution of the Army in India strategically considered.

On the defence of our N.-W. Frontier.

On the defence of our N.-E. Frontier.

On the Sanitary Condition of the Army in India, British and Indian.

On the defence of the Ports and Coasts of India.

On the system of Military justice of our Army (British and Native).

On the practical education of Officers generally, especially of Staff Officers.

Notes on lessons taught by warfare in India, or against undisciplined enemies.

Reviews of Indian Campaigns with the lessons deducible therefrom.

On the conduct of operations among Mountains.

On the arming of the Native Army.

On the danger to, and aid derivable from, India in the event of a war with France, Russia, Prussia, or America.

Records of the History of Native Regiments, and of the services of British Regiments in India.

Memoirs of distinguished Native Soldiers.

Memoirs of distinguished Officers who have served in India.

On the possibility and advantage of inducing a large number of our time-expired British Soldiers, to settle in India.

On the advantages to be derived from a system of appointing our Soldiers, European and Native, to the numerous posts under Government from which they are now debarred.

On the aid which might be derived in the event of rebellion in India from the organisation of all British and Eurasian subjects as fighting men.

On the Military training of our Native Regiments.

Plans of operations of Campaigns, in which the Army of India might be engaged, whether within or beyond our frontier.

On the results which will probably follow from moving Troops, British and Native, in course of relief by rail instead of by route march.

On the advantages of fortified posts as shewn during the Mutiny.

Punka-pulling by machinery adapted to Barracks and Hospitals of European Troops.

On Regimental Workshops, Gardens, and Soldiers' Industrial Exhibitions.

On the formation of new cantonments, and the conditions under which Civilians should be permitted to purchase house property therein.

On the carriage of Regimental reserve of Breech-loading Ammunition in Mountain Warfare.

On Military Law as a branch of an Officer's Education.

On the uses of torpedoes in River and Coast defence in India.

On the advantages of practice against moving targets for Artillery and Infantry.

On the requirements of a force of, say, 20,000 men, organised in India, for service in foreign parts, as regards Officers for staff employ with the force, and on the best means of supplying them under the present organisation of the Native Army.

On the best means of educating Native Officers, so as to bring them up to the requirements of the present day as regards Military knowledge.

Critical accounts and reviews of the siege operations of Indian Campaigns.

The causes of the increase of crime in the Army in the hot season, and its remedy.

On the advantages and defects of the system of organisation of Artillery by Brigades.

On the Topography of the Military Districts of India in its relation to strategy.

On Fortification in India.

On Pontoons and Portable Bridges for Indian Service.

N.B.—This List is not meant to deter any one from writing on any other subjects.

PATRON :

His Excellency The Right Hon'ble LORD NORTHBROOK.

VICE-PATRONS :

His Excellency GENERAL LORD NAPIER OF MAGDALA, G.C.B., G.C.S.I.,
Commander-in-Chief in India.

His Excellency LIEUT.-GENERAL SIR FREDERICK PAUL HAINES, K.C.B.,
Commander-in-Chief Madras Army.

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Commander-in-Chief, Bombay Army.

Commander-in-Chief of the Royal Navy, Indian Station.

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Colonel Osborne, C.B., 6th Royal Regiment.
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Surgeon J. M. Cunningham, Sanitary Commissioner.
Surgeon A. F. Bradshaw, Surgeon to His Excellency the Commander-in-Chief.

The rest of the Council have not yet been elected.

SECRETARY.

Lieut.-Colonel John Baillie, Bengal Staff Corps.

LIST of Members who have joined since the publication of No. 5.

No.	NAMES.	RANK.	CORPS.	STATION.
1	Laughton, D. W. ...	Captain ..	Madras S. Corps....	Chiculda (Berar)
2	Hunter, J. ...	Lieut.-Colonel, doing duty with C	Royal Artillery Batty 16th Bde.	Morar.
3	Jacob, H. E. ...	Colonel ..	Bombay Staff Corps.	Asseerghur.
4	Laughton, C. D. *pd*.. .	Captain ...	Asst. Commissioner	Mysore (Madras)
5	Morgan, A. B. ...	Captain ...	19th Foot. ...	Allahabad.
6	Hartshorne, A. G. ...	Captain ...	Qr. Mr. 35th N. I.	Cawnpoor.
7	Bowey, G. B. C. *pd*....	Lieutenant ..	E. 19th Royal Arty.	Allahabad.
8	Gordon, J. J. H. *pd*....	Lt.-Colonel ...	29th Punjab I. ..	Jhelum.
9	Beddy, E. *pd*....	Captain ...	29th Punjab I. ..	Jhelum.
10	Perkins, A. E. *pd*. ..	Major ...	Supdg. Engineer North W. P. ...	Bareilly.
11	Anderson, R. P. ...	Colonel ...	Comdg. 34th N. I.	Morar.
12	Harcourt, P. H. ...	Captain ...	1-24th R. A. ...	Morar.
13	Robertson, D. ..	Captain ..	44th Regt N. I. ...	Shillong.
14	Kinloch, A. A. A. *pd*...	Captain ...	60th Rifles ..	Rawul Pindee.
15	Baillie, N. B. ..	Surgeon ...	Civil Surgeon ...	Bhagulpoor.
16	Thomas, W. G. *pd*....	Lieutenant ...	25th K. O. B. ..	Umballa.
17	Steven, H. B. ...	Colonel ...	12th K. G. Regt. ...	Sealkote.
18	Taylor, T. ..	Colonel ..	41st N. I. ..	Buxa Bhootan.
19	Clutterbuck, T. *pd*....	Captain ...	Fort Adjutant. ..	Attock.
20	Wetherall, W. A. *pd*. ..	Lieutenant ...	22 Regt. Bom. N. I.	Neemuch.
21	Jacob, *pd*....	Colonel ...	22 Regt. Bom. N. I.	Ditto.
22	Nuttal, *pd*....	Lieut.-Col. ...	22 Regt. Bom. N. I.	Ditto.
23	Ritchie, *pd*...	Captain ...	D-18th Royal Arty.	Ditto.
24	Adam, *pd*....	Captain ..	Staff Officer. ..	Ditto.
25	Stevens, *pd*...	Captain ..	3rd Light Cavalry.	Ditto.
26	James, *pd*....	Lieutenant ...	3rd Light Cavalry.	Ditto.
27	Doran, J. ...	Lieut.-Col. ...	27th P. Infantry...	Barrackpo.e.
28	Irvine, C. ...	Lieut.-Col. ...	27th P. Infantry. ..	Do.
29	Gordon, W. ...	Colonel ..	Adjt. Genl.'s Dept. Chief Inspector of Musketry.	Simla.

LIST of Officers who have agreed to undertake the duties of Corresponding Members for the United Service Institution of India at stations noted opposite their names.

NAMES.	CORPS.	STATIONS.
Lieut.-Col. J Hills, V.C., S.C.	Royal Artillery	Abottabbad.
Captain W. R. Craster	Ditto	Agra.
Lieut.-Col. W. J. Gray	Ditto	Allahabad.
Captain Bythell	Staff Officer	Asseergurh.
Major Conway-Gordon	B. M. Hydrabad Contingent	Aurungabad.
Lt.-Col. H. N. D. Prendergast	Royal Engineers	Bangalore.
Captain A. G. Waterfield	Station Staff Officer	Barrackpore.
Major W. Hicks	Brigade Major	Belgaum.
Lieut.-Colonel W. Barlow	5th Native Infantry	Benares.
Captain G. Merewether, R.E.	P. W. Department	Bombay.
Lieutenant E. R. Elles	Royal Artillery	Bunnoo.
Major J. B. Hardy	Ditto	Cawnpore.
Captain D. McNeil	41st Madras Native Infy.	Cuttack.
Lieut.-Colonel Blair Reid	Bengal Staff Corps	Dalhousie (temporarily).
Captain A. Battye	2nd Goorkhas	Dehra Doon.
Captain G. B. Wolsely	Station Staff Officer	Delhi.
Major P. Story	1st Goorkhas	Dhurmsala.
Dr. C. R. Francis	Dy. Inspr. Genl. of Hospitals.	Dinapore.
Captain W. Galbraith	85th Light Infantry	Dugshai.
Captain G. Lamb	Ordnance Department	Ferozepoor.
Colonel R. Cadell, C.B. S.C.,	Royal Artillery	Fort St. George. [nopoly.
Major B. L. Forster	Ditto	Fort St. George & Trichi-
Captain W. Ker	3rd Buffs	Fort William.
Captain P. C. Story	26th Regiment	Fyzabad.
Captain J. F. F. Cologan	18th Native Infantry	Goruckpoor.
Lieut.-Col. H. Beville, C.B., S.C.	1st Beloches	Hyderabad, Sind.
Lieutenant W. S. Peat	Brigade Major	Jacobabad.
Captain Fitz. G. Gallwey	Adjutant, 8th Brigade, R.A.	Lucknow.
Captain R. H. Rosser	37th Regiment	Mean Meer.
Captain Studdy	Royal Artillery	Meerut.
Captain A. G. Handcock	6th Native Infantry	Morar.
Captain R. B. Cambell	Guides	Murdan.
Captain A. C. Crookshank	32nd Native Infantry	Umballa.
Captain G. W. B. Collis	6th Royal Regiment	Peshawur. [bleshwar.
Captain J. Van-Straubenzie	Royal Artillery	Poona, Bombay or Maha-
Captain Edward Gunter	59th Regt. Adjt. Genl's Dept.	Poona and Bombay gene-
Captain F. S. S. Brind	17 Regt. Station Staff Officer	Shillong. [rally.
Lieutenant W. Macdonald	12th K. G. Regiment	Sealkote.
Lieutenant R. G. Kennedy	18th Hussars	Secundrabad.
Lieut.-Colonel W. Dowell	Royal Artillery	Seetapoor.
Colonel H. S. Adams	13th Bombay Nat. Infy.	Surat.
Captain H. Collett	Dy. Asst. Qr. Mr. General	Umballa.

LIST of Members who have offered their services as Translators.

FRENCH.	GERMAN.	ITALIAN.
Major W. L. Twentyman, 18th Hussars	Captain Ottley, R.E.	Major Siddons Young, B.S.C.
Major E. Hill, 4th Cavy. Hyd. Cont.	Capt. D. S. Warren, 1-14th Regt.	Major C. Hills, 4th Regt., Cavy., F. C.
Major Siddons Young, B.S.C.	Capt. Edward Gunter, 59th Regt.	Captain J. W. FitzGerald Cologan, B. S.C.
Capt. James Colquhoun, R.A.	Lieut. Sawyer, 19th P. I.	
Captain J. F. Fitzgerald Cologan, B.S.C.	Lieut. A. O. Green, R.E.	
Capt. A. Crookshank, 32nd PI.	Lieut. H. C. M. Turnbull, 6th Royals.	
Captain A. R. Loughnan, Brigade Major, Bareilly.		SPANISH.
Lieut. H. Sawyer, 19th P. I.		
Lieut. A. O. Green, R.E.		Lt.-Col. J. Baillie, B.S.C.
Major M. M. FitzGerald, R.A.		
Captain T. Clutterbuck		

UNITED SERVICE INSTITUTION OF INDIA

PRIZE MEDAL ESSAY

The subject of the " Prize Essay" for 1872-73 is

" On the organization of a Transport Department suitable to the exigencies of the British Army in any part of the globe."

By order of the Council,

JOHN BAILLIE, LIEUT.-COL.,

Secy. U. S. I. of India.

ORIGINAL PAPERS.

I.

On Military Law, as a branch of an Officer's study.

IT cannot, I fear, be denied, that Military Law and Military Lawyers are unpopular "institutions;" and that, not only, though chiefly, with the non-military class. They are, moreover, the objects of a peculiarly rampant mistrust and dislike in India, where, of all places in the world, Military Law is most extensively studied and practised.

I do not propose to discuss fully the several causes of this state of things; but before I attempt to evoke, for the study of Military Law, some of the zeal and interest which attach to other military topics, from the management of a *corps d' armée*, to the fashion of a soldier's habiliments, I must endeavour to show that the subject is really worth studying, and is not the profitless, if not mischievous absurdity which it has so often been misrepresented as being.

II. The chief cause of the unpopularity of "Military Law," at any rate with the general public, is the ignorance which prevails respecting it, conjoined with the jealousy and suspicion which have attached to that "*imperium in imperio*" Military authority, ever since a Standing Army was introduced, under the Stuarts.

Equal ignorance, it is true, exists among the masses, as to English Law; but, on the "*omne ignotum pro magnifico*" principle, the latter is revered and trusted, almost as unreasoningly as the former is decried!

That like cause has not, in both cases, produced a like result is because, while military jurisdiction is misunderstood and mistrusted, it is part of the popular creed that the judge's ermine is spotless, and the judge's knowledge infallible; and the halo and prestige enjoyed by the Bench is largely shared by the Bar!

In the second place, Military Law is very generally confounded with the much feared and hated institution of "Martial Law;" a confusion of terms which is traceable not only in some of our received military authors, but even in the preamble to the Mutiny Act itself.

The great distinction between the two is clear enough to those who have closely studied the laws of the Army: but such students are few; and it is, at any rate certain, that thousands of otherwise well-informed people not only confound Military Law with Martial Law, but do not know what Martial Law itself is! Martial Law, when in force, applies to all persons whatsoever, civil or military, and makes them liable to military tribunals, for offences which, ordinarily, are not so cognizable

at all. Military Law never, under *any* circumstances, applies to any persons save those who are amenable to the Mutiny Act and Articles of War, or to any offences save those declared by itself.

The late Duke of Wellington defined "Martial Law" as "the will of the Military Commander," exercised during the suspension of (or, occasionally, even concurrently with) ordinary civil jurisdiction. This, however, like many another sententious apothegm, if taken alone, conveys a very erroneous impression. It is true that, when Martial Law has been duly proclaimed, the Military Commander can, at his discretion, order the trial of civilians as well as of soldiers for civil offences; and that Military Officers are, then, the jurors and judges, in place of those whose functions are in abeyance. But such abnormal tribunals cannot administer justice according to the mere "will of the commander," or even according to their own clear military code; they can only, legally, punish according to the (dormant) civil law;* and any illegal procedure, or irregularity of jurisdiction, would expose their members to pains and penalties.

This, it is clear, is a very different matter from the "Military Law" contained in and declared by the Mutiny Act; a law which, at all times and in all places, is absolutely limited to persons belonging to, or connected with the Army; and from which, civilians, as such, are entirely exempt, even in time of war, and during the temporary eclipse of the ordinary courts of judicature.

Lastly, dislike and distrust of Military Law is largely traceable to, or, at any rate, has been much aggravated by, frequent and persistent misrepresentations in the newspapers; more particularly the newspapers of this country.

These misrepresentations, though occasionally, doubtless, the honest opinion of an Editor or a Correspondent, are due, as a rule, to utterly erroneous, and often palpably interested versions of particular "*causes célèbres*;" and in every instance within my knowledge, the public might readily have been disabused of the false and mischievous impressions so disseminated; but that the hands of those who could have set people right were tied by the time-honored, and I think, unwise, etiquette of the Indian Service, which absolutely prohibits official notice of newspaper articles.

Against such unfavorable criticisms, I could easily cite the published opinions of many high authorities, eminently entitled to speak "*ex*

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* The liability of officers and soldiers for *criminal* offences committed where there is no court of ordinary jurisdiction, is an illustration in point. *(See Section 101, Mutiny Act, and Articles 143, 145).* In such cases all the forms and details of procedure are military; but the sentence must be in accordance with the Criminal Law.

It seems to be an undecided point whether, when Martial Law is in force, in a foreign country, occupied by a British Force, the law to be administered is British Law, or the ordinary local law; but I fancy the proper rule, in such case, is that the penal liability should depend on the nationality of the culprit. This was the practice followed by the Duke of Wellington, when Martial Law was in force in the Peninsula; and its propriety seems to have been accepted by Parliament in 1851.

cathedrâ;" not only as to the admirable nature of the "Court Martial System," as it has been called, but as to the marked success and advantage of its administration; and that, too, more particularly in India, where Military Law has been so specially decried!

Any extended discussion of this topic would be out of place, here; but I have, I hope, said enough to clear away, "*in limine*," some at least, of the prevailing distaste for my subject. Nay, I will even hope to arouse, for the study of Military Law, some of the zest and interest which attach to the pursuit of English Law, on which it is based, and to which it is so closely related; somewhat as a "poor relation," doubtless; but come of the same noble stock; and boasting, albeit in a different degree, of the same objects, the same excitements and triumphs, and it may, with all reverence, be added, the same "glorious uncertainties," as English Law!

III. It will, surely, be admitted that some attractions must exist in the study, however superficially, of a subject which, in every civilized country, has, for ages, attracted and held enthralled many of the brightest intellects of the time! There must be a fascination in the practice, at however humble a distance, of that pursuit which, in our own country, has so occupied so many noble lives, and led so many enthusiastic followers to fortune and fame!

There is not wanting, too, in the practice of Military Law, a spice of the combative element which lends such zest to ordinary legal practice; and which should, at any rate, not lessen its attractions for the soldier! It is a mere truism to say that every trial, however intrinsically trifling, involves the struggle of right with wrong; and although, at a military trial, there is not (fortunately) the same heat of conflict, and the same strong personal excitement as those which often characterize important civil cases, there is a very considerable amount of interest, and of "fight" too, sometimes, in a cleverly contested military trial, and a strong sense of well won triumph, when, after patient and intelligent investigation, the guilty are punished, or the innocent vindicated. Moreover, I hope to shew that, in one sense, a military trial possesses an interest and importance which can never attach to any civil case, however sensational. I trust, also, to prove that the too common objections to the study of Military Law are groundless, and that officers are *bound* to study it, not merely as a simple matter of duty, but by the still stronger spur of professional honor, which, alone, should impel them to acquire the knowledge, without which they can never be the safe or worthy custodians of the Army's fair fame, or of the honor, liberty, or life of their brother officers and soldiers!

IV. "*Ignorantia non excusat legem.*" Every subject is bound, at his peril, to know what he may, or may not do, or leave undone, without a punishable breach of law. But as regards the laws of the Army, the officer has another and a far higher incentive to their study, besides the merely selfish desire to "take care of number one!" As one of the

appointed guardians of his service, he has to try and punish military offences, in others, as well as to eschew them for his own sake ; and, to discharge this high and honorable trust worthily and usefully, he must know something of the laws which govern the Army, and which render it a safeguard instead of a terror to the Nation.

We all know how a Barrister will, as the phrase is, " throw his soul" into the case of a client, whom he has, perhaps, never seen, and with whom he has no community of feeling or interest ; and we can all appreciate, and have often, perhaps, envied the *éclat* of forensic triumphs, and the *agrémens* of Counsel's fees ! But I maintain, a military trial has an interest and a reward of a far higher character. The military Officer is not the mere paid advocate of one party in the case ; he is, at once, counsel on both sides, juror and judge ; both the Prosecutor and and the Prisoner belong to his own brotherhood of arms ; and he is the arbiter between them ; honored with the double trust of guarding the discipline and fair fame of the Army, as his Sovereign's representative, and of watching over the just interests of an accused comrade.

Every military case tried affects, more or less, the honor or security of the whole Army, and every Officer serving on a Court Martial should feel that, for him, there is a personal stake in the issue : a satisfaction when deserved punishment wipes out a blot in the " stainless shield" of the Service : a joy and relief when the honor or innocence of an accused comrade is vindicated before the world !

We should hear less against the Court Martial system, and less of the irksomeness of Court Martial duty, if Officers would, generally, take this higher view of their judicial functions, and regard a Court Martial, not merely as a substitute for an everyday penal court, but as being really, what it is so often called, a court of military honor, still retaining many of the chivalric features and characteristics of the old warlike times, when military disputes and military offences were dealt with, either by the Sovereign in person, or by the chief knights of England, the Earl Marshal, or Lord High Constable.

V. I now come to the question, why the study of Military Law is so much more unpopular and neglected, in the Army itself, than that of many other professional subjects. Musketry, for example. How many Officers take " degrees" at Hythe, though there is no order for such advanced proficiency, and though they, themselves, will never be called upon to handle a rifle, on duty, save, perhaps, to teach other " young ideas how to shoot !"

All honor to those who do so qualify themselves, in that, or in any other branch of an Officer's " curriculum," a knowledge of which must so largely add to their general efficiency. But, as we are taught concerning moral duties, " these should ye have done, and not have left the other undone."

The study of Military Law is, and has long been, enjoined upon Officers with exceptional force and impressiveness ; and the answer to

my question must be sought in the general disfavor with which the subject is viewed, and in erroneous ideas as to its importance, and, perhaps, as to the practical advantages of studying it.

It has long been a fixed idea that the study of law, in *any* shape, is dry and wearisome ; and we all know what tough customers " fixed ideas" are to combat!

I can only say, in a very limited sense, " *experto credite* ;" but I can, at least, aver, that so far as I have gone in the study, I have found it, in a high degree, attractive and engrossing.

Were an Officer to limit his legal studies to the Mutiny Act and Queen's Regulations, he might, with reason, complain of a certain absence of excitement and interest in his work ; but I need hardly say, the study of Military Law should go far beyond this. It should travel into the same tracks, though not necessarily to the same extent, as those followed by the regular law student ; and the best lawyers will be the first to declare that the greater the progress made, the deeper becomes the interest and enjoyment of the explorer. Such experienced witnesses would emphatically repudiate, for the study of criminal law, the epithet " dry," unless, indeed, in the sense in which we apply it to champaigne, of which exhilarating fluid, dryness is, among the initiated, the acme of praise !

The student of Military Law need not be repelled by the idea that any vast amount of erudition is necessary ; or that, to become a proficient Military Lawyer, he must risk becoming a dullard in other respects. Pope's well-known saying :—

> " A little learning is a dangerous thing ;
> " Drink deep, or taste not the Pierian spring."

however true of some studies, does not apply to that of which I am writing ; for, in Military Law, though extensive knowledge is desirable, a " little learning" is infinitely preferable to none at all ; and moreover, the little, once attained, almost always given a taste for more.

Then, as regards the idea that legal studies have a tendency to render men dull in other respects ; small doses cannot, surely, effect what the deepest potations have failed to produce! and whatever may be said of certain other studies, no one can allege that distinguished lawyers, as a class, have ever been wanting in other branches of general knowledge, or in the qualities which command success in society! On the contrary, the biographies of many of our great men tend, rather, to shew that the study and practice of law brightens and sharpens the intellect generally, and paves the way for success in many other channels of distinction.

Another explanation of the general neglect, among Officers, of the study of Military Law, is, I think, a common idea that, for the security, it is unnecessary ; because, in all essential points, the actual work is done for them, the responsibility resting with other persons.

It is quite true that there is, in India, and to some extent in England, a staff of trained military Judge Advocates, who conduct all the more important trials, and who generally regulate, and are responsible for, the administration of Military Law. But, so, also, is it true, that every Regiment and Battery has its Commandant, who regulates and directs its drill, and is responsible for its general efficiency. We do not hear it argued that, because individual Officers are thus commanded and guided, they need not, themselves, study drill, or any other part of their duties as subordinates ; and yet, there is no doubt, this very style of argument is, tacitly, used by many, for neglecting the personal study of Military Law and procedure, which, far oftener than the " Field Exercise," have to be put into practice without any direct aid or guidance!

Again, many Officers, and some of great experience, consider that the study of Military Law, besides being dry, and practically unnecessary, involves that of many puerilities and antiquated absurdities ; and that many military rules as to charges, evidence, and procedure, are capricious and nonsensical.

I can only say, on this point, that most of our rules of procedure will be found in the military codes of the leading Nations of Europe ; so that if we are puerile or absurd, we are so in excellent company. That our rules of evidence are, fundamentally, the same as those which guide the highest courts of the Realm: while our procedure rules save us from many of the intricacies and subtleties which often vex and perplex other courts. And that our rules as to charges, and the definitions of military offences, which some find so bewildering, are based upon long experience of their propriety and necessity ; and if, in some cases, very antiquated, have at any rate, much of the wisdom which is proverbially associated with remote ancestry!

I will illustrate this by one striking case.

There is no military charge which has been more discussed than " Disobedience of lawful command ;" or as to which misapprehension is so frequent.

Many people fail to appreciate the great distinction between verbal and actual disobedience: between the mere " choleric word" which, however criminal in the subordinate, at most gives a bad example to others, and flouts some individual superior, and the *actual* disobedience, which may imperil a regiment or an army! But, in fact, the distinction, so insisted on in Military Law, can lay claim to a very exalted and ancient origin.

It is enunciated in our Lord's parable of the two sons, ordered to work in their father's vineyard, of whom, one said, " I will not, but afterward he repented and went," while the other said, " I go Sir, and went not." (Matthew xxi. 28—31) We could not have a more forcible illustration of the distinction, in criminality, between mere verbal

refusal, without actual disobedience, and obedience in word followed by disobedience in act!

VI. I will now consider the incentives to the study, some of the objections to which I have endeavoured to meet. These incentives are, as I have already urged, twofold ; honor and duty.

I think, I have already said enough as to the first, the strength of which needs no iteration to a body of Military Officers ; but I must offer a few remarks as to the other motive.

All will, of course, admit the general principle, that it is the bounden duty of an Officer to obey orders ; and also, to perfect himself, as far as possible, in every branch of his military education, whether the particular study be enjoined in orders, or not.

As regards Military Law, this duty is not only self-evident, but it is the subject of more numerous, and more impressive orders, both in England and in India, than any other branch of an Officer's training.

It was, I think, in the year 1838, that the importance of the study was first fully recognised at the Horse Guards. At all events, in that year, its neglect was publicly noticed; a more general distribution of the Mutiny Act and Articles of War was ordered ; and it was notified in Horse Guards' General Orders of the 22nd May (re-published in India on the 6th September) that Regimental Officers would thence forward, be expected to obtain " an early and thorough knowledge of " the laws and ordinances under which they discharge one of their most " important (because most solemn) duties ; *viz.* that of President or " Member of a Court Martial."

Inspecting Officers were directed to ascertain, and report, if the order was attended to ; and to report specially, *and by name*, any Officer of a Regiment, who neglected " to make himself acquainted with the " provisions of the Mutiny Act and Articles of War."

This stringent order was not, it would seem, very strictly carried out ; but, as we all know, the Queen's Regulations have long contained provisions similar to those which now form the 733rd paragraph, in the Section on Courts Martial. That paragraph is as follows :—

" The duties devolving upon members of Courts Martial are of " the most grave and important nature ; and in order to discharge them " with justice and propriety, it is incumbent upon all Officers to apply " themselves diligently to the acquirement of a competent knowledge of " Military Law, and of the orders and regulations founded thereon, as also " of the practice of military courts, with the view of making themselves " acquainted with the nature and extent of the powers and authority " vested in them by the Legislature ; by the temperate and judicious " exercise of which, the discipline and character of the Army are to be " maintained."

Corresponding instructions have, for very many years, been promulgated in the Indian Military Regulations of each Presidency. (See

for example, para. 1, Section 21 of the Bengal Military Regulations). Many other occasional orders could be cited; but nothing can be stronger or more unmistakeable that what I have quoted, as illustrating the imperative *duty* of studying Military Law.

Lately, there has been what may be called a "Revival" on the subject. Facilities have been afforded for uniformity and accuracy of procedure; the standard of proficiency for the Judge Advocate General's Department, in India, has been fixed by severe examination tests, which must be passed before a candidate is admitted to its ranks; and Military Law, to a limited extent, is one of the branches of the lately introduced course of garrison instruction, both at home and abroad.

I think, however, I am justified in saying that we want something more than accuracy in bare procedure; something more general than even the highest proficiency in a small and hardworked Staff Department: and a far wider and more searching course of study than that contemplated in the scheme of Garrison Instruction, admirable though that is, so far as it goes.

The fact is, Officers must study, for themselves, seniors as well as juniors; and the revival of the orders issued in 1838 would doubtless, do much to expedite this desirable result. Once make it manifest that such study is an imperative duty; that it must be undertaken, on pain of report; and that *no* Officer will be advanced who has not attained some degree of proficiency in it; and sooner or later, all will "make a merit of necessity." Duty is a spur which acts upon all; it will stir up, alike, those if any, who are too callous or too careless to respond to the call of honor, and those who are too proud to study with the sole object of personal gain or advantage!

The duty of studying Military Law is far more urgent in India than it is at home. In England, Courts Martial, as a rule, try only offences against discipline; and, many, even of those, when involving serious assaults, come under civil cognizance; while thefts, embezzlement, and other offences of a felonious or fraudulent nature, which comprise some of the most difficult cases, are, almost invariably, dealt with by the Magistrates, or by the superior law courts.

In this country, on the other hand, Courts Martial not only habitually try every offence whatsoever which comes within the provisions of the Mutiny Act or Articles of War, but also, with rare exceptions, offences against the Criminal Law of India, under Section 101 of the Mutiny Act.

The military Officer in India has thus to adjudicate upon every variety of military and civil crime; and has not only to administer, as counsel, juror and judge, his own army laws, but, also, the Penal Laws of India; in lieu of the highest tribunals of the country, where trained lawyers practice, and judges of the highest reputation preside.

Even this is not all. India has a Mixed Force, and the Native Army has its own separate law, and its own regulations and rules of pro-

cedure. These, too, need close and careful study; and that not *only* by Officers directly connected with Native Troops, some of whom wield such exceptional powers under the 90th Article of War. Every European Officer in India may, at some time or other, have to deal judicially with native soldiers, either as member of a Court Martial for their trial, under Article 75, 96 or 97, or as the Commandant of a Mixed Force, although he may never, actually, have served a day with Natives. Then, again, the Native Commissioned Officers of the Indian Army look to European Officers for guidance in legal matters; so that the European Officer has not only to act for himself, but often for others also. It was proposed, in 1862, to call upon even *Native* Officers to study Military Law; and measures were initiated for the preparation of a vernacular manual on the subject, for their use. It may, at least, be said of this project that it had more practical sense in it than one lately started by a newspaper correspondent, who suggested, with seeming earnestness, that our Native Officers should be instructed in Geology, Hydrostatics, or some other scientific subjects! but it is not a matter of either surprise or regret that the idea came to nothing.

In this Presidency, Native Officers, now, hardly ever sit on any Court Martial save a General Court, at which the proceedings are conducted by a trained Judge Advocate; and whenever they sit on District or Regimental Courts Martial (a practice still largely obtaining in Madras and Bombay), they are associated with an experienced European Superintending Officer, by whom they are relieved of all responsibility for the legality and correctness of their procedure.

It seems to me, therefore, that Native Officers, while they would undoubtedly be more useful and efficient, in proportion to the extent of their general knowledge, including some insight into the laws which govern their Service, may very well be left uninstructed in this particular subject, and free to devote their energies to subjects more closely bearing on their personal duties and functions. But, the very fact that they are left to the guidance of European Officers, is the strongest reason why such Officers should not, themselves, be "blind leaders of the blind!"

VII. As regards the study of Military Law, Officers may be divided into four classes: 1st. Those who study it thoroughly; 2ndly, those who study it to the extent contemplated by the course of garrison instruction; 3rdly, Those who are contented with a knowledge of the Mutiny Act and Articles of War; and, lastly, those who never study it at all, and probably never even give it a thought, except, perhaps, on the occasion of some "wig" or "remark" by superior authority, for errors, or failures of justice, due to their ignorance or carelessness!

I can say nothing more, to this last class of Officers, than I have already said; and I pass it by.

The Officers in class 3 literally obey the orders of 1838 to which I have, before, alluded; but they can scarcely be said to obey the spirit,

if even the letter, of the Queen's Regulations, as to qualification in Military Law.

The second class consists, mainly if not entirely, of young Officers; and for these, half-yearly examinations are prescribed; the text books for which are, the Mutiny Act and Articles of War, the Queen's Regulations, and the latest edition of "Simmons on Courts Martial," in studying which they have the advantage of the lectures and explanations of the "Garrison Instructor."

A fair knowledge of the text books named, must involve a very respectable acquaintance with Military Law and procedure, as applicable to the European Forces; but there is much, not only in Simmons, but in the Mutiny Act itself, of which a fair and intelligent knowledge is scarcely attainable, without a reference to *other* books, while it may reasonably be doubted if the hard-worked Garrison Instructor will be able to explain adequately the more difficult features of a subject, of which his own theoretical and practical knowledge must necessarily be limited; while his continuous labor will almost preclude him from personal study of it.

It is, I fancy, generally admitted, that Military Law is one of the most superficially treated of the subjects taught at the Staff College; and if so, "*custodes quis custodiet ipsos?*"

However, the scheme, so far as it goes, is, undoubtedly, an admirable reform: and Officers who pass the prescribed tests, however ignorant of the law and procedure for Native Troops, (save in so far as they may tally with the European Code,) will be qualified to conduct European General Courts Martial of a simple character. It is worthy, I think, of consideration, whether such Officers should not be distinguished, in the Army List, by some letter or letters denoting their having passed what we may call the "little go" in Military Law. Those who qualify as Judge Advocates are distinguished by the letters M.L.

As to the first mentioned class of Officers; those who aim at entering, or at any rate officiating in, the Judge Advocate General's Department, or who are anxious, without any such ulterior views, to study thoroughly a subject of admittedly vast importance to the well being of the Army; they are already numerous, and their number will, it may reasonably be hoped, largely increase.

Such students, and I may say, Officers in general, will always find willing advisers in the Officers of the Judge Advocate's Department; and, when at Head Quarter stations, can have the advantage of access to the Departmental Books. For the most part, however, their studies must, necessarily, be independent, and pursued at their own cost in the matter of books; the list of which, in this Presidency, is somewhat numerous. I am unaware of the practice in Madras and Bombay; but the Officer in Bengal, who wishes to pass as a candidate for the Judge

Advocate General's Department, has to pursue the subjoined course of reading:—

1. The Annual Mutiny Act and Articles of War.

2. The Indian Articles of War (Act V. of 1869).

3. The Indian Evidence Act (Act II of 1855).

4. The Indian Penal Code (Act XLV of 1860).

5. The Queen's Regulations (Section 14 on Courts Martial, &c., and portions of Sections 7, 15, 17, 19, 23, 25, 27, 28, 29, 30 ; and of the Appendices).

6. Bengal Military Regulations (Sections 21, 22, 23 and 53.)

7. The Government and Army General Orders connected with Courts Martial and Courts of Requests.

8. The practice and procedure of Military Courts; that is Courts Martial, Courts of Inquiry, and Courts of Requests.

9. Simmons, on Courts Martial.

10. Archbold's " Pleading and Evidence in criminal cases."

11. Some standard work upon general evidence.

Book study, alone, however will not suffice. The student should frequent the practical school as well ; attending Courts Martial, and noting how theory is carried into practice by the Judge Advocate, or by the experienced Officers who, at important trials, fill the office of President.*

As regards junior Officers, attendance at Courts Martial is a prescribed duty (see para. 734, Queen's Regulations, and paras. 5, 6, Section 21, Bengal Military Regulations) ; but it is by no means, young Officers only for whom careful and practical study of Miiitary Law is essential ; and, moreover, a candidate for the Judge Advocate General's Department must be an Officer of some standing in the Service.

It is much to be regretted that there is, in India, no recognized text book or manual to simplify the study of Military Law and procedure.

A work of the kind was published in Bombay in 1854 ; much of which is of undoubted value ; but it contains so much that is obsolete or incorrect, that it would be useless, now, as a guide in either European or Native cases.

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* Orders have lately been issued, which will ensure the uniform appointment, to European General and District Courts, of Presidents of acknowledged ability and experience. *See G. O. No. 341, dated 23rd December 1871.*

The works of Hough and Kennedy, apart from any other defects, are open to the same objection ; and the works published in England, and relating to the European force only, even if admitted as correct in principle, as far as they go, are too partial to meet the want felt in India ; and are not considered *sufficient*, even at home ; for the desirability of a comprehensive text book on Military Law, as an accompaniment to the proposed reform of Military Law itself, was strongly urged by the Royal Courts Martial Commission which sat in 1869.

What is required is, a comprehensive, but simple manual, treating of the general principles of Law and Evidence ; the variations thereof peculiar to courts military ; and the various regulations and orders, as to procedure, now in force ; eliminating every thing redundant or obsolete.

One of the chief difficulties which the student, at present, meets with, apart from the intricacies of law itself, is the number and confusion of the existing orders as to matters of practice and procedure ; and the contradictions and perplexities involved by the frequent issue of new constructions, or rules, without the formal cancelment of those previously in force. In this respect we may expect a considerable reform, so far as Bengal is concerned, in the forthcoming revised Military Regulations ; but a still better reform would, I think, be, to have a code of such regulations for Military Courts for the whole of India. In many respects, it is, doubtless, necessary to have separate Military Regulations for each Presidency ; but this necessity cannot apply to rules for Court Martial procedure, which, as regards natives, are, or should be, the same all over India, and as regards Europeans, are the same all the world over.

Further discussion on this point will be more appropriate in an article upon the state of the system of administering military justice in India, which I hope, shortly, to prepare.

VIII. This article has extended to much greater length than I anticipated ; and I feel bound to apologise to the readers of the United Service Journal for detaining them so long from more palatable subjects.

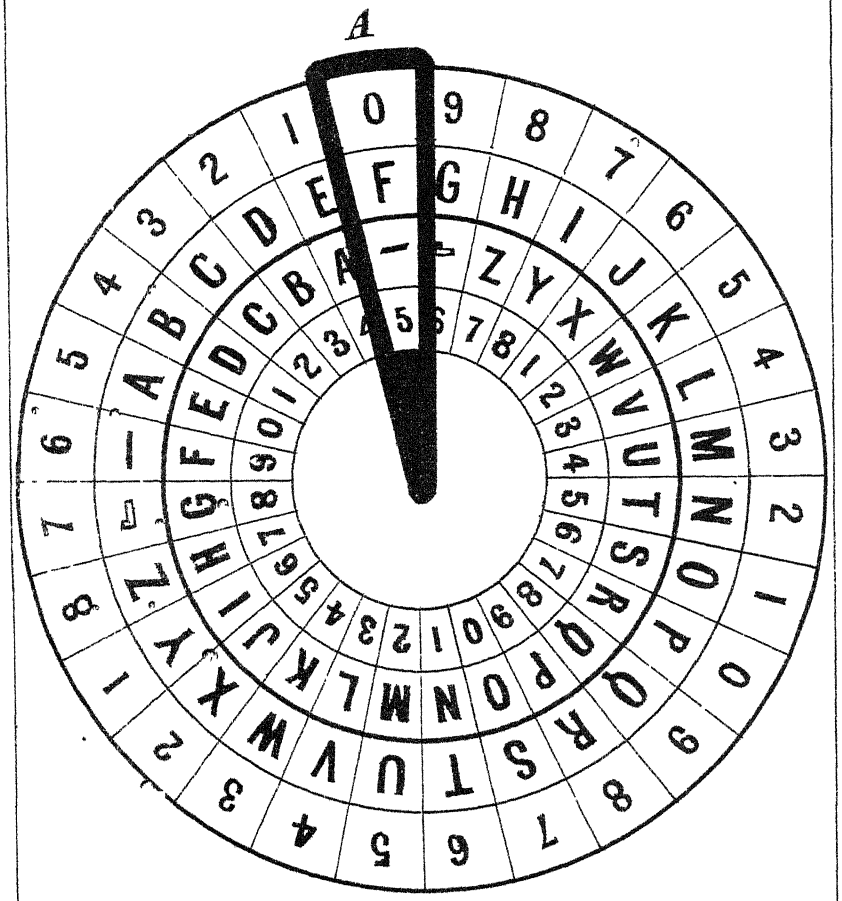
I can only say that what I have, to the extent of my ability, treated of, besides being of unquestionable importance in itself, possesses, for me, a very great interest ; and that I have been anxious to omit nothing which seemed likely to create or increase an interest in it on the part of others. I doubt not that many of those who have already written in this journal, know full well how much more *laborious* it is to write a short than a long article ; and how difficult it is to avoid the Scylla of obscurity, in striving to eschew the Charybdis of prosiness !

I really have not had *time* to compass greater brevity ; and I can only hope that I have not defeated my object by discussing it "*ad nauseam* ;" and that no one will quote, against me, the proverb of that proverbially talkative nation the French,

"Qui trop dit, ne dit rien."

FRED. MAISEY, *Col.*,
Judge Advocate General.

FIG: I
THE CRYPTOGRAPH
CODE BOOK



A. Arm

II.

Army Signalling and Telegraphy—The Cypher System.

THE "Cypher System" although not so essential to the Army Signaller in this country, as in any other part of the world, for the reason that our ordinary signals, especially messages from the Code Book, would puzzle any enemy that we are likely to come into contact with at present, is still such a valuable system, and one on which we may never know when we shall have to depend entirely, that I am of opinion it cannot be too carefully studied. I therefore trust, that the following ideas which suggested themselves to me, both during, and since I passed through the course, may not be considered out of place, but may help to simplify, what most undoubtedly is one of the most important features of the system of "Army Signalling and Telegraphy."

Before proceeding to explain the Instrument and System that I propose, I will first describe the "Cryptograph" or Cypher Wheel as laid down for general use in the "Code Book," drawing attention at the same time to another plan suggested by Colonel Wolseley in his "Soldier's Pocket Book," in order, that the advantages and disadvantages of the different systems may be compared by the readers of these notes.

First the "Cryptograph or Cypher Wheel" as laid down in the "Code Book." It consists of two discs, one large and one small, *vide* Fig. I, to the latter is attached an arm A, by means of which it is turned. The outer circle consists of figures 1 to 0 running from left to right continuously. The inner is filled with the alphabet from left to right and ending with two signs — end of word, and end ⌐ of message. The inner disc is a facsimile of the outer, only that the alphabet signs and figures are reversed entirely.

To turn a message into cypher with this instrument, the following process has to be gone through. First, a "Keyword" which must not be one of common occurrence has to be decided on, for example sake, let us suppose, "Friday" to be decided upon. The sender must first write out in his pocket-book his message letter by letter above the Keyword which has to be repeated continuously letter by letter to the end of the message, and above these two lines he enters in the same manner the Cypher, finding it out letter by letter on the Cryptograph. F is the first letter of the Keyword, turn the arm with — sign of end of word on it round until it covers the F on the outer disc, then look for the first letter of your true message, which we will say is "Ammunition failing, send supplies," would be *A*, on the outer disc, and put down the letter you find under it on the inner disc *viz. E*, this will be the first letter of your Cypher Message.

Then turn the arm A to the second letter of your keyword, look for the second letter of your true message, and under it you will find your Cypher Letter.

In this way you put down the whole message, always turning the arm A to the letter of the Keyword next in order, look for letter of true message that is above it, on the outer disc and you will find the Cypher letter below it. At end of word you of course write the Key letter as it must be the same *vide* Fig. I.

Always remember that in sending or receiving a Cypher message, the outer disc represents the True Message, the lower or inner the Cypher. The above mentioned message will be written out in three (3) lines as follows :

E. e. x. k. o. p. m. i. v. R. a, s. e
A. m. m. u. n. i. t. i. o. n. — f. a
F. r. i. d. a y. F. r. i. d. a. y. F

i. y. w. o. a. F. s. d. a. y. y. o. y. u
i. l. i. n. g. — s. e. n. d. — s. u. p
r. i. d. a. y. F. r. i. d. a. y. F. r. i

p. q. p. a. s. i. d.
p. l. i. e. s. — ¬
d. a. y. F. r. i. d.

When you come to the end of a word in sending a message, you give the letter above the sign and then drop the flag. You receive and put down the message in the same manner except that you write the Cypher letters over the keyword first, and the true message forms the upper line. If you are reading a message directly the flag is dropped, you get to work with the Cryptograph, and try and decipher the message only reversing the order described in sending a message.

It takes longer to decipher a word in this manner, unless one is in first rate practice than it does to signal it.

Secondly, Colonel Wolseley's Plan.

A Keyword is necessary also for this and must on no account have a letter repeated in it. Colonel W. describes his plan as follows :

Divide a square into 25 twenty-five spaces and fill them in as in Fig. II. This method of numbering them, and the keyword, is all that one has to remember. Given the Keyword " Majesty" fill in the spaces with the letters commencing from the upper left hand corner, and working to the right. The remaining spaces are filled in with the alphabet without the letters that have already been given by the Keyword.

COLONEL WOLSELEY'S CYPHER BOARD. FIG. II.

1 M	2 A	3 J (I)	4 E	5 S
8 T	9 Y	10 B	11 C	6 D
7 F	12 G	H	12 K	7 L
6 N	11 O	10 P	9 Q	8 R
5 U	4 V	3 W	2 X	1 Z

On the centre square there will always be a letter which has no number, so when it is necessary to use it, the true letter is given.

To send a message by this, look for the letter, note the number above it, and substitute for it the letter you find in the space having a corresponding number. For instance, "We attack at Noon." You look for W. you find 3, turn to the corresponding 3 and you find in it space, T. or T. The above message in Cypher will read, T. V. X. R. R. X. O. G. X. R. D. C. C. D. To decypher this you just reverse the above process.

In using this Cypher there is no need of distinguishing the end of word which will render your message less liable to be decyphered by the enemy either if they are watching your signals or your message falls into their hands.

I will now proceed to explain my plan and also the instrument which I propose now to adopt and my reasons for considering that it should supersede both of the systems already described.

Perhaps it would be better first to describe the Instrument which is simply an adaption of the one in the Code Book, the difference being (*vide* Fig. III,) that the arm is done away with, the two discs are made of thin wood or block tin moveable on an axle fitted into a handle, the upper end of the axle is provided with a nut by which means the two discs

are clamped tight or loosened as required. The top of the axle is a screw on which the nut works. When a message has to be sent or read with this instrument, the man working it, holds the handle, in his left hand disc's face upwards, loosens the nut and is ready for the message.

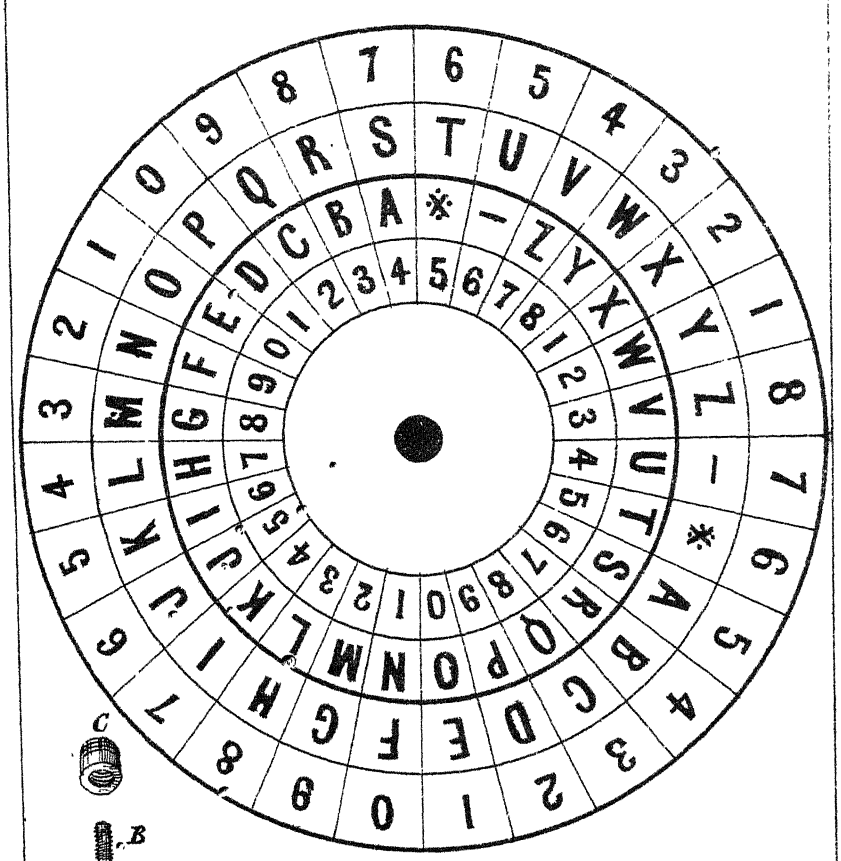
I should have mentioned that the sign — end of word comes next to Z and * is end of message instead of ¬ as the " Code Book" Cryptograph.

I have founded my system on the supposition which I shall endeavour to prove is right that a Complicated Cypher such as the two first mentioned, is entirely unnecessary.

It is plain that the more complicated a Cypher is the more difficult it is to find out its true meaning, and where time is no object perhaps it would be better to use the most elaborate one that could be invented, but where as in Army Signalling, rapidity and simplicity are the great points, a difficult Cypher appears to me to be a great mistake. In the first place I have shown what a tedious and laborious task it is writing out and decyphering a message according to the method laid down in the Code Book. This may certainly puzzle an enemy, but take into consideration the time taken up by your corresponding station in making it out. Time is invaluable under such circumstances, and if you can send a Cypher so simple that your friends can read your message almost with its true meaning at once and act upon it, the enemy not having the Key will be puzzled sufficiently long to counteract all the advantages of a difficult Cypher.

Again we must take into consideration that an enemy, at least in a generality of cases ; would not be either directly in front or rear of a signal station, but in a flank position. Now all army signalmen know that one of the first duties they are taught is to wave the flag at right angles to the line of sight *viz.* that their position should be exactly facing the corresponding station unless the direction of the wind forces them to stand differently and they also have experienced the difficulties of reading messages, when they are at all carelessly signalled or when proper attention has not been paid to the back ground. However the inequalities of the ground render it difficult at times to distinguish the dots from the dashes with any amount of certainty. How often do you hear the expression, " I was in such a bad position." Such I imagine is the position an enemy would generally find himself in and with a Cypher message to find out as well, sufficient time would elapse to allow of its being acted on before he could decypher its true meaning. Accordingly I consider that a key letter is quite sufficient for Cypher messages as I look on the duty of settling beforehand a keyword or letter, as one that might be forgotten, I would suggest that the Key letter should always be the first letter of the true message and change every time a message or answer is sent. Now these frequent, although sim-

FIG 2
CRYPTOGRAPH
PROPOSED BY GAPTN HENNELL



ple changes would be in my opinion very difficult to follow especially in signalling a number of short and urgent orders.

Note the ease and rapidity with which this system is worked. The following message has to be signalled. "The enemy are moving in force on the right." T. is the Key letter, the Signalman as before described holds the handle of the Cryptograph in his left hand, discs upwards, with his right hand he turns the inner disc and places the sign * (end of message) under T clamps the two discs with the nut and by turning the left wrist can read off the Cypher to the man signalling with the flag. The message will read in Cypher. T. L. O. U. O. F. O. G. W. U. G. E. Z. K. F. M. U. K. F. U. N. E. B. Q. O. U. E. F. U. T. L. O. U. B. K. M. L. T. U. T. The man with the Cryptograph at the other station, would proceed in exactly in the same manner. Nothing has to be decided on beforehand and no elaborate process of writing out the messages is required. Supposing the station replies "Have they many guns." Both Cryptographs are taken in hand, the inner discs changed to H, and you immediately have a new Cypher. This of course may change twenty times a day.

This system has one other advantage which would be almost impossible with the other two.

It is thus. In the first place there need not be any stop at the end of every word I mean of course by a stop the lowering of the flag except in the case of its becoming necessary to change into Cypher in the middle of an ordinary message. When signalling in the presence of an enemy, the Cryptograph should always be at hand, and directly the first letter of a message is received, the inner disc should be moved as described above, for supposing you noticed after giving "the enemy are" that they were reading your signals and you wanted to change into Cypher, the man using the Cryptograph which he has already fixed at. T goes on calling out the remainder of the message in Cypher. Your corresponding station having got "The enemy are" read E. E. Z. K. F. M. U. and see that the flag is lowered. The man at once sees that this makes no sense so takes up his Cryptograph and reads off "moving" and — end of word. Gives the understood and takes the remainder in Cypher. Very few of our own Army Signallers would I believe be able to follow or decypher such rapid changes as these unless warned beforehand.

I am of opinion that Signalmen should be practised in the above.

By reference to Fig. III, the reader will be able to follow the first and third examples of my system.

Colonel Wolseley lays stress on the fact of dropping the flag at the end of a word being a hint to the enemy, and it most undoubtedly is, but then Colonel W. gives no sign or letter for the sign, so that his Cypher shows no connecting links which are at times rather necessary, when one or two letters may have been signalled or read wrong.

In sending short sentences, the signalman hardly requires to stop but with my system it he is tired he can rest himself for a short time at any period of the message without reference to the words, but should an ordinary message be turned into Cypher suddenly, it should be an understood thing that the flag is to be dropped after the first Cypher word to give time to the Corresponding Station to find out that you have changed to Cypher, which they will show by giving the understood.

In conclusion I would point out, that in my system nothing is left to chance, and that the Cypher, although simple, still allows of messages being sent in it, with such celerity and precision ; that the saving of time gained over the other two methods is, in my opinion ; a matter of the greatest importance. In Army Signalling simplicity combined with rapidity of action is of the utmost value and nothing can be gained by using a system which is liable to puzzle friends as well as enemies.

Of course where messages in Cypher have to be written and sent by hand and there is a chance of their falling into the hands of an enemy, the more elaborate the Cypher is, the better, but for field signalling where every moment is of value, a difficult Cypher is unnecessary.

In signalling, the words should be numbered as the groups of figures are in Code Messages, &c. at the end, if you are at all in doubt about a certain word you can give the " repeat" and its number. This is better than giving the " Not Understood" after the word which necessitates a stop at the end of each word, which is in itself a hint to an enemy as before mentioned.

I trust that the above will induce other officers, to give their experience of the " Cypher System," with a view to its being more thoroughly improved.

R. HENNELL, *Capt.*,

25th Regt. N. L. L.

III.

On Cavalry.

WRITING an essay on Cavalry, which will be readable, short, and at the same time comprehensive, seems a difficult matter. To write an exhaustive essay would be hopeless from the time it would take, and the length to which it would extend.

I therefore propose to touch on the subjects of *organization, formation* and *tactics* each in its turn, but without going deeply into any one of them, on the preliminary point of *material*, there is little to be said. The desideratum being speed and lasting power, the men should not be too heavy, and the horses as good as can be procured for the price allowed.

With regard to organization then, I consider the first point to be to lessen the dead weight on the horse with as little loss of efficiency as possible. This I should propose to do as follows :—

Every Cavalry Regiment to have attached to it a certain number of light carts (say, one per troop) solely for the above purpose. These carts should be on the strength of the regiment and always kept up, should work with the regiment on parade, so as to learn their proper place under all circumstances, and should accompany the regiment wherever it went, and a few tattoes per troop would enable the regiment to afford assistance when required. If the description of the sort of cart required were advertised, manufacturing firms in England would soon turn them out, with every desideratum for a campaign; for instance, light iron bodies with facilities for quickly unshipping the wheels and punting them across rivers where the fords were deep. By the use of these carts, a great part of the dead weight might be taken off the horse, which I should reduce as follows. The valise to be carried by the cart, as also a proportion of spare shoes and nails, picketting gear and nose-bags. The trooper would then have to carry as dead weight on the horse his arms, saddle with a light blanket underneath it, (unless there was room for the blankets in the cart) the saddle should have a pair of wallets holding a tin flask of water, a day's rations, a pair of warm stockings and a short light flannel shirt ; his cloak strapped behind in place of the valise, which would enable the trooper to keep his bridle hand low, and manage his horse better than if it was fastened in front. His arms and ammunition should consist of a sword, a breech loading longish barrelled pistol and twenty cartridges worn on a waist-belt supported by a belt over the shoulder. I would, however, retain a small proportion of carbines say four file per troop for convoy and other duties, these being of a light pattern. Farriers to wear no swords, but in place of them, to carry six pairs of shoes, nails, &c., and then only arm to be the pistol for their defence. My reason for substituting the pistol for the carbine

is lightness, and though a carbine is a better weapon, I would subordinate everything to taking weight off the horse. Cavalry skirmishing, with a view to damaging the enemy is in my opinion a farce, the business of cavalry when extended as skirmishers is to cover a very great extent of ground, observe what is going on, and convey information rapidly, and the fire-arm whatever it may be is simply for defensive purposes, or as a signal of danger ahead. In fact, what is now designated, skirmishing should, according to my ideas, be abolished and scouting or patrolling substituted for it, each small scouting party extending so as to cover as much ground as possible.

I have not entered deeply into this part of my subject, my object being merely to suggest what I consider manifest improvements on the present organization. I will now say a few words on formation including tactics and the uses to be made of Cavalry generally.

I am very strongly in favor of always working Cavalry in rank entire. By this method its physical force in line of battle is nearly doubled, and at the same time its moral strength is increased. There is no doubt that knowing there is a support at hand, gives men great confidence in an attack, and, in infantry, this is produced by the rear rank close up, but in Cavalry, the feeling of the front-rank man would be. "If I or my horse goes down, I shall have the rear-rank horse on the top of me," whereas, a rear-rank manœuvred as a supporting regiment at two or three hundred yards in rear gives the confidence required.

There are many formations previous to the attack recommended by military writers, and of course, much must depend on the ground, but as a rule and the circumstances of the ground being favorable, I prefer a double column formation for first line and support as being the formation easiest and quickest for getting into line. The reserve might generally be in close column. In both these formations a regiment can be kept well in hand, and that is a very great point.

There might be frequently circumstances in which other formations would answer better, for instance, echellon formations, either of troops from the double column, or of squadrons from the line or close column, especially when a flank was threatened, as well as the front, but a Cavalry Commander would at once see the best formation for his three lines, the great object being to keep the two first lines well in hand, and expose them to fire as little as possible before the moment of attack, and to lay down rules, to be adopted under all circumstances is clearly impossible.

Every Cavalry force in the field, whether in presence of the enemy, or in his vicinity, and, in fact, at all times during a campaign, when it has once taken the field, should employ scouting parties as an intelligence department, for which duty intelligent men should be specially trained. The main points of training would be to learn to judge of the general lay of a country, the obstacles to be met with, and its generally

adaptability or the reverse for Cavalry ; also when in sight of the enemy to judge the strength, and to observe and report their movements, and at night to accustom the ear to take the place of the eye.

Officers and intelligent men should be often practised in these duties as far as practicable, and taught to put down on paper clearly and concisely the result of their observations.

Jomini recommends as a formation, quarter deployed, quarter in column on each wing, quarter in close column in reserve. The two quarters in column on each wing of the first line are clearly in order to be able, at whichever flank it was required, to unfold quickly a greater extent of front for the attack, the quarter on the wing unfolded dropping back as the support.

It may be advisable, at any time, for the first line or the two first lines to get into close columns for charging squares by successive squadrons, which seems the only way of charging a square. I will return to this part of the subject later.

The position of Cavalry in an army previous to the attack should be to the rear of the flanks of an army, and it is obviously very desirable that the Commander of the Cavalry should be left as much unfettered as possible by orders, and trusted to seize opportunities promptly as they occurred for making attacks or demonstrations, such opportunities being generally very transient, and a Cavalry Commander should always bear in mind these two great principles ; first, that an attack should never be made (but under very exceptionable circumstances) without a support and reserve, and secondly, that it is very unadvisable to commit your whole body, especially early in the day. If the force is large enough, a certain proportion should be dismounted in a concealed spot and horses and men kept as fresh as possible for later operations or pursuit. There are certain manifest opportunities for a cavalry attack. For instance, if cavalry can get on the flank of infantry engaged with infantry, success is a certainty, the enemy being unable to form square from fear of the converging fire of the opposing infantry. Secondly, when infantry in square is exposed to the fire of artillery. Thirdly, when the enemy's force is retiring, at which time constant successive attacks are likely to turn the retreat into a rout. Fourthly, to protect and give time for the retirement of its own army. Fifthly, when batteries of the enemy's artillery can be caught with a weak escort, at which time a rush on the guns even if there is only time to cut the traces, may be of immense use. There may be many other opportunities which will be seized or slipped just according to the quickness of observation and readiness of the Commander.

It is very desirable in any great combined attack of cavalry that there should be infantry to back them up, one of the peculiarities of the cavalry attack being that whether successful or otherwise, it leaves the attacking force, for the moment, very much at the mercy of any fresh

troops, and until it has had time to retire and re-form, it is quite unfit to receive an attack. I have very little doubt myself (though the contrary opinion largely prevails) that a cavalry attack ought to be successful even against a square.

Hamley in his " Operations of War" (from which I have drawn occasionally in this Essay) says—

" In the last great wars originated the notion which now prevails " that cavalry cannot break steady infantry, though it is clear that " *in no formation*, can infantry really withstand a cavalry charge push- " ed home, and that when horse fail to break foot, it is from moral not " physical causes."

I believe the principal reason for the prevailing notion is that infantry greatly outnumber cavalry, and that the square being their *safest* formation against cavalry, they are of course *taught* that it is absolutely safe. This notion has gradually spread from the greater number to the smaller, and thereby the moral strength of the infantry is increased, and that of the cavalry proportionately lessened. Arms of precision and increased range have also tended to increase the confidence of the one and to lessen that of the other. But with regard to these points, there is a good deal to be said on the other side. In the first place, the efficacy of rifle fire is very much overrated, being based on target practice at known distances. In the second place, whilst at a distance, but rapidly moving towards infantry, cavalry would be comparatively safe at any but the point blank range from the impossibility of judging and shifting sights rapidly, and, at the point blank range of say 150 yards, or so, the fire would be no more deadly than that of the old " Brown Bess." Of course, if cavalry stand still anywhere within range and remain stationary, they are liable to be destroyed. There was a great deal of talk at the time about the 93rd in line sending off, with a volley or two, a mass of Russian Cavalry by which they were threatened; but, in the first place the Russians were in a deep column formation; were not, I believe, advancing at any great pace, and thirdly and chiefly, the Russians retired because they had never had any intention of making a charge home and thought the sooner they got out of range, the better. In fact, they appear to have been miserably handled throughout the campaign, as witness the charge of our Heavy Cavalry Brigade at Balaklava against a great mass of Russian Cavalry which advanced to meet them, but pulled into a wall as they approached and were " chawed up" accordingly as the last joined cornet in the service would have predicted. The great rule should be that cavalry (except for a certain specific purpose which I will notice presently) must never stand still within range, and directly they are brought within range for the purpose of attack, must move rapidly, but steadily on that point, which (as cavalry can easily cover 1,000 yards in between three or four minutes) it would not take them long to reach and as only during thirty seconds or less they would have been within point

blank range, I cannot conceive that good cavalry, properly led, should not, under these conditions, make good their charge and ride over and disperse the *best* infantry in line or even in square.

I consider then, that, on the whole, arms of precision have not, in any appreciable degree, affected the cavalry attack. Breech loading weapons may possibly enable infantry *occasionally* to deliver an extra volley when cavalry is within 200 yards but once within that distance, the safest course is forwards, and if this course is taken, the infantry *must* come to grief. There are two great safeguards to cavalry after entering what I call the dangerous part of the attack, *i. e.* the last 200 yards. One is that the moral effect of a charge persevered in to that point, the appearance and sound of cavalry coming down at top speed, must to a certain extent, intimidate infantry, and every one who has been on service at all must have observed that directly infantry lose their coolness, they begin firing in the air. Secondly, the cavalry soldier himself is very much protected from the fire by his horse, and to bring down a horse within the last 150 yards, or so, is no easy matter, he may have one two or more bullets in him, and yet be able to keep on his legs, and perhaps continue his speed for that short distance. These points cannot be too much impressed on cavalry, as giving confidence, and I cannot but think that I have at least proved this much that, *infantry in line cannot successfully resist cavalry*, and that even in square infantry are not absolutely safe, and when in that formation their advance is stopped, their fire slackened, and they are exposed to telling fire from artillery.

Another point for cavalry is that combined with artillery they are much more than a match for infantry and artillery (supposing the ground to be tolerably open) because the latter are stopped on their march, and *may* be destroyed, the former can move as they please and *cannot* be destroyed.

If Generals *will* use cavalry in utterly unauthorized ways, as, for instance, at Woerth when the French cavalry charged infantry drawn up just outside a wood, of course they get their cavalry destroyed, and the public through the Press cries out " how useless are cavalry !" But where cavalry is kept to its legitimate uses, it is as useful in line of battle as ever, and in other respects, much more so, since long range weapons have come into use as I shall presently proceed to show.

I must now hark back, for a moment, to show when cavalry may be stationary, or nearly stationary within range. The simplest way will be to quote instances. In 1843, as the army under General Sir Charles Napier was approaching the battle field of Meeanee, certain configurations of the ground made it difficult to observe the whole of the enemy's position. The General therefore sent the Scinde Horse on ahead to form one long single-rank line, and to extend their files so as to show the formation of the enemy by drawing his fire. This, being performed,

intelligently was perfectly successful, and from behind this screen the General made his formations and advanced in order of battle.

Another instance. At the battle of Hyderabad, the General wished to bring up artillery across some very bad ground on the left of his line unobserved. This was done behind a screen of cavalry which stood as a target, whilst the sappers were cutting passages for the artillery over ravines. With regard to either cavalry or infantry, it *may* be nenecessary, for the purpose of gaining some object, to present a body of troops as a target to the enemy, either to gain time, or to conceal a movement, but these are the only cases in which I can conceive it necessary for cavalry to remain stationary within range.

I will now go on to show, in few words, how cavalry has become *more* important to an army since the introduction of long-range weapons than before.

The fact of the increased range has forced armies to engage at longer distances, to have their reserves further back, and to show a greater extent of front in consequence of shallow formations. This makes changes of front and reinforcements of weak points more difficult, and here comes one of the great uses of rapidly moving cavalry. I have also very little doubt that this necessity for speed, will necessarily bring into the field what to us is a new description of force though extensively used in the American War, *viz.* Mounted Infantry a most useful force considered as infantry, but if attempted to be introduced in supersession of cavalry, as proposed in a pamphlet some years ago, an utter and ruinous mistake.

The British public are continually taking up altogether false views with regard to cavalry and military matters generally, and the worst of it is that the Press which endorses these views, or expresses them, is so influential, that it is difficult for the authorities to make an effective stand against it. In the Prusso-Austrian War, the conclusion arrived at by the public seemed to be that the whole art of of war consisted in having a needle-gun, the rapid movements and accurate combinations of the Prussians being quite ignored. In the American War the conclusion arrived at was that there were no troops like volunteers. In the Franco-Prussian war, the conclusion arrived at was exactly the reverse. In the Franco-Austrian War cavalry was made very little use of, no doubt from the incompetence of the Commanders on both sides. The public at once drew the conclusion that the day for cavalry had gone by. The American, Austro-Prussian and Franco-Prussian Wars sent round the Public Weather-cock to the opposite quarter.

My own idea is that the present is pre-eminently the day for cavalry from the vast extent of ground coveted by modern armies. They are the eyes and ears of an army and the greater the extent of ground covered the more need of eyes and ears. Rapidity of movement and independence of support enable cavalry to gather information at long

distances from its main body and in proximity to the enemy with comparative immunity. They collect and send in supplies, destroy telegraph wires, cut off convoys and messengers and convey intelligence of all the movements of the enemy. The army, therefore, which is strongest in cavalry and most intelligent in its use, will have an immense advantage both in subsisting itself and saving its own depots and in intelligence of the enemy's movements, probable plan of campaign, &c., particularly, whilst the two armies were distant, and as they approached by guarding against surprises, manœuvring towards the enemy's rear and threatening his base line, to say nothing of their uses in line of battle.

A plan carried out formerly in the Bengal Light Cavalry, though I believe, discontinued for the last forty years, has often struck me as a most excellent addition to the organization of Light Cavalry.

It consisted in having two light guns attached to every cavalry regiment, called Galloper Guns, and forming an integral part of the regiment, and commanded by one of the subalterns of the regiment. I believe this organization was adopted in Lord Lake's time, who was in the habit of making long forced marches with his cavalry and galloper guns and beating up the enemy's camp when supposed to be far distant.

There are several other points which might be gone into on an essay of cavalry, and should not be omitted to render the essay complete, such as picketting, training of remounts, best breed of horses, &c., but this paper is already so long that I dare not write more, so will conclude by a few further remarks on the subject of Cavalry as an intelligence department. This is a most important matter, and the education of a certain proportion of men in every regiment, selected for their particular aptitude and general intelligence should be no longer delayed.

One of the majors or a captain might be selected for the superintendence of this duty, and a proportion of subalterns, non-commissioned officers and privates selected for this work, any man found deficient in intelligence being exchanged. They should be divided into parties of three or four, and sent out into the country into different directions, the time of their absence from head quarters being defined. On their return, the head of each party should show a rough sketch of the country traversed, with a concise account of the approximate distance covered, the general features of the country, and any particular facilities or obstacles to the movements of different branches of the service over the country traversed, the remaining men of each party should also make short notes independently, and in order, that they might learn to do these things in the simplest and best forms, the whole body of scouts should, three or four times a year, go out into camp under a garrison instructor or other staff officer qualified to teach them their various duties. They should also, whenever feasible, be practised, from long distances in observing bodies of troops and estimating their numbers. Thus would be formed, in every regiment, an excellent body of scouts, invaluable to the commander of an army and to the commanders of re-

giments, and from this nucleus, the numbers of scouting parties might be indefinitely increased, picquets taught how to patrol intelligently beyond their videttes, and the efficiency of a regiment incalculably increased.

I append two or three quotations from Hozier's "Seven Weeks War," illustrating the working of cavalry under different circumstances.

Advance to Brünn.

"As soon as the columns got out of the town, the hussars spread "themselves out over the fields by the side of the road, and studded the "country with horsemen. Some went pushing through the corn, others "galloped forward to gain every piece of rising ground, and, from the "summit, to scan the country beyond. Every wood was carefully beaten, and every village inspected by the nimble horsemen before the "main body approached."

Advance to Brünn.

"Here the road ran through a narrow defile, with high banks co-"vered with plantations, and the houses of the village standing across "the pass would have formed a strong position for the Austrians to "hold. On approaching the village, the cavalry was halted, and the ri-"flemen were sent for to beat through the wood and push in among the "houses."

The crowning and clearing of the pass is then described, and when the defile was passed, the dragoons again took the lead, spreading out again over the country.

Tobitschau. Attack of an artillery train by the 5th Cuirassiers.

Bredow, under cover of some undulating ground formed his regiment in echellon of squadron for the attack of the guns. The first squadron he kept towards his right to cover the flank of his attack from any Austrian Cavalry which might lie in that direction, the second and fourth squadrons he directed full against the front of the battery and supported the second with the third as a reserve.

* * * * * * "When within a few hundred "paces of the battery they broke into a steady gallop, which increased in "rapidity at every stride that brought the horses nearer to the Austrian "line. All the time of their advance the gunners poured round after "round into them striving with desperate energy to sweep them away "before they could gain the mouths of the cannons."

* * * "The flank squadrons bending a little way from their "comrades made for the end of the line of guns in expectation of "finding there some supporting cavalry. The two centre ones went "straight as an arrow against the guns themselves and hurled themselves "through the intervals between them upon the gunners."

Eighteen guns, seven waggons, one hundred and sixty-eight horses with one hundred and seventy prisoners fell into the hands of the Prussian force. A noble prize to be won by a single regiment. *It lost only 12 men and eight horses.*

I now conclude my sketch. I feel that I have not said a tenth part of what might be said on this interesting subject, but anyhow I have made a beginning, and I hope other and better cavalry officers may take up the subject, and then I shall not have written in vain.

T. R. SNOW, *Colonel,*

Bengal Cavalry.

Moradabad, 3rd February 1872.

IV.

Remarks on organization of Native Infantry.

In No. III Journal of the Proceedings of the United Service Institution of India, Colonel C. Ross has proposed a new organization for our Native Infantry, and in so doing has forestalled me in submitting a proposal almost identical.

I venture, however, to disagree with him on one or two points, and to add one or two paragraphs to the proposal. For convenience of reference I quote Colonel Ross' proposal.

1 Commandant, as at present.

1st Battalion Officer, 2nd in Command and Wing Officer, as at present.

2nd Battalion Officer, Wing Officer, Commanding Left Wing, as at present.

3rd Battalion Officer, to command one company of 150 men.

4th Battalion Officer, ditto ditto ditto.

5th Battalion Officer, ditto ditto ditto,

6th Battalion Officer, ditto ditto ditto.

1 Adjutant, as at present,

1 Quarter Master, as at present.

1 Surgeon, as at present.

Total 10 European Officers.

4 Subadars, as at present, 1st and 2nd Class.

4 Color Havildars, to be carefully selected, and well educated men, keeping the accounts, and working the details of the company, at Rs. 30, each.

20 Havildars, at Rs. 20, each.

40 Naiks, at Rs. 15, each.

20 Lance Naiks, sepoys on probation for promotion with an increase of Rs. 2 on sepoy's pay.

600 Sepoys, as at present.

This differs from the present organization chiefly :—

In the division of the battalion into four companies instead of into eight. In the addition of two extra officers holding the position of the present Wing Subalterns, but exercising a more direct command over a portion of the regiment. In the decrease of the Subadars from eight to four, the entire removal of the Jemadars, the substitution of four Color

Havildars on large pay as the working men of the companies, the diminution of the number of Havildars, and the institution of paid Lance Naiks. The Color Havildars, he says, might be called Jemadars, but should be the working men of the company under either denomination. It will be perceived, that if these men were Color Havildars, there would remain only four commissioned officers in the Native ranks with the regiment. This appears to me an error in both a political and practical point of view. The dignity conferred by a commission, the privilege of a chair, and the title Jemadar *Sahib* are highly prized by Natives. They act very beneficially while the men are with the regiment, by raising them at once above their quondam equals in the ranks, and impressing them with a sense of their own superiority, and the responsibility the position confers, and these honors accompany the native officer to his village, where they not only give the actual possessor a higher social status, but enable him to transmit a certain portion of his dignity to his family, thus distributing through the country a class of men holding influential positions in village communities, who are more likely than almost any others to be well disposed to our government.

The organization under review would at once do away with three-fourths of these men, and would at the same time deprive the native ranks of three-fourths of the highest prizes to which they can now aspire, and that too when the duties of a soldier are daily becoming more arduous.

But besides the political bearing of the question there seems to me to be an inexpediency in this proposal in a practical point of view. These working men, whether styled Jemadars or Color Havildars would, in a great measure, be fixtures at head quarters, and would not be available for commands or detached duties of any larger portion than a Havildar's party should require to be detached. In the Punjab Frontier Force, where there is a great deal of outpost duty, and in many other stations, one Subadar would almost always be engrossed by this duty, should another be sick, and a third absent on urgent leave or furlough, there would remain but one native officer at head quarters available for station and regimental duties, or for any emergent call to detach another officer. The working men, if Jemadars, would certainly be available for station and regimental duties, but furlough and sickness would affect their number also, and even under these circumstances, think, there I would be found a paucity of native officers to perform those duties which Havildars, although more carefully selected, would be unfitted to perform.

There seems too a certain awkwardness in the position of the Havildar who would act as Jemadar during the working man's absence.

In my opinion, it would be better to have four Jemadars on Rs. 35 each, and four Color Havildars on Rs. 25 each. This would increase the cost of the regiment by Rs. 120, but would still leave it below its present cost. I would make the Color Havildars the working men of

their companies, and if my reasoning is correct, there would be no fear of the Jemadars being mere idlers. It must be remembered that even then there would be only eight men to perform the duties which are now distributed among sixteen. The number of native officers retiring would be double that which would occur under Colonel Ross' proposal, and would serve to keep up that influential class to which I have before adverted, and a clever, ambitious man might still look forward with some confidence to gaining a commission with its privileges.

Colonel Ross, it will be seen, proposes to style the officers in charge of companies "Battalion Officers." The name I had proposed giving them was "Company Officers," and considering their duties, that still seems to me the more appropriate title.

While on the subject of the officers I would suggest, that the Wing Officer should in virtue of his position, rank as third senior in the regiment, this would do away with the anomaly of a wing officer detached with his own wing being possibly commanded by one of his own company officers, an anomaly which might occur even when he paraded his wing for instruction, etc.

In the scheme under review, the following proposal occurs relative to terms of enlistment:—

"That the first term should be extended to four or five years, that "the first good conduct rupee should be given at the completion of that "term, when every man should be again enlisted for a term of three "years, and so on, getting an extra rupee each term."

1. This places no limit to the number of times a man may get increase of G. C. pay, thus a man of sixteen years' service would get Rs. 12, an increase in the cost of the regiment, which Colonel Ross has omitted in the estimated cost under his proposal.

2. It moreover still leaves the lowest grade very badly paid.

3. There is no provision made for the loss that would accrue to a man of say thirteen years' service whom the commanding officer did not see fit to re-enlist.

1, I should prefer making each term of service four years, giving Rs. 8 for the first term, Rs. 9 for the second so on till Rs. 10 was reached, beyond which I would not go. This I believe would make the service more attractive without exceeding the expense to the State.

2. This would start the recruit with better pay.

3. I would grant to such men who wished at the expiration of each term to re-enlist, but were refused by the commanding officer, a gratuity of one month's pay for each year of service, thus at the end of his second term a man so discharged would get $9 \times 8 = \text{Rs. } 72$.

This would enable commanding officers to get rid, with less compunction, of men who were manifestly unlikely to serve beyond their fifteen years, and would ease the pension establishment without hardship to the individual.

There is one other point I would urge, which would, I believe, prove a very great boon, and that is a free kit to each recruit on joining. At present the first year of a recruit's life is one of continual struggle. Not only has he to learn his drill and duties, but his pay is so heavily mulcted to pay for his Half Mounting, that he is unable to set himself up well in cooking pots or clothes, or to afford himself any small luxury in the way of milk or goor or meat. He thus becomes disgusted with his career at its very commencement, and only looks forward to the time when he may claim his release. The cost to Government would not be large. Placing the value of the kit at Rs. 20, and allowing 20 recruits per annum, a number, I think, sufficiently large under four years enlistment terms, the annual cost to Government would be only Rs. 400.

H. C. P. RICE, *Capt.*,

1st Sikh Infantry.

V.

Lecture on the Profession of Arms.

Delivered to the Soldiers of the Rawul Pindee Garrison, April 8th, 1872, by Major Arthur Cory, B.S.C., Brigade Major.

WAR, the purpose of the profession of Arms, is based upon certain instincts which humanity only shares with all the forms of life with which we are acquainted on the earth.

It is hostility, the spirit of enmity, seeking vent in action.

It is, in its most elementary and vital principle, not only independent of reason, but opposed to it in many of its aspects.

Whence those instincts spring, and why they are so deeply and universally implanted in the nature of all sentient creatures, are questions beyond the province of our present enquiry. But it is essentially necessary in considering the rules which guide the conduct of war to bear in mind its origin, that it is born of the passions and not of the brain, for this remembrance will be as the index needle of the compass to the chart we peruse, without which enquiry would but lead us astray.

The object of War, is primarily and broadly the destruction of life in the persons of those against whom the sentiment of hostility is aroused. Its art is to effect this with the greatest certainty and speed, and with the least cost and danger. Its science is the reduction of empirical rules, *i.e.* rules taught by experience, to a system which may be explained to, and learnt by the inexperienced through precept and instruction.

But although war has thus its primal causes beyond the dominions of reason, the intellectual faculties are immediately brought in to aid its purposes when once they have been engendered; unreasoning as the passions in themselves are, they enslave the brain by their power and energy, and compel it to their service. Not only do they do this but in their turn they stimulate it and augment its capacity, and the men who have most imperishably engraved their names on the iron tablets of war, are the same who in all ages have been acknowledged the first in mental supremacy.

In certain phases of public opinion which may be marked on the roll of history as recurring simultaneously with those lulls of peace which intervene between the cycles of contention, War is sometimes characterised as an exceptional and unnatural state, and condition of mankind. Such opinion can only be formed by the most narrow and circumscribed perception, for the truth is that Nature herself is one eter-

nal warfare. Throughout the entire animal kingdom on land or in ocean we find it, not only ever present, but the ruling power on which the whole scheme depends. There is no law so wide, none so invariable, as that the destruction of life in some form is the very condition of existence to another, and viewing the world as a whole and especially as the habitation of the human race, there is no period discernible in which it can be asserted that war has ever ceased on its surface, and no period in which any nation has been absolutely free from the dread of it. The apprehension points to the perpetual presence and sense of danger, and shows that at times of even supposed peace, the spirit of hostility is but latent, and that the smouldering embers of war are ever ready to break into a flame. The provisions of purely civil society for the maintenance of internal order are based on the same considerations, and the axiom is assuredly true and incontestible, which affirms that force in some shape or another is the real foundation of order and safety.

We can still trace on the fading records of extremest antiquity the same characteristics of our race which distinguish it now, the same aspirations, and the same infirmities, the virtues that develope into vices, the passions that grow into powers either to ennoble or to destroy; the emulation that ends in envy, the indignation that culminates into hatred, skill that ripens to fraud, and desires that fester into corruption; are as rife now as they were before the flood, and these things are the springs of war, and it will last so long as they last.

If then the theorists who lose themselves in metaphysical speculation concerning a coming millenium of peace would really face the logical conclusions of their own arguments they could not fail to see that the cessation of war must involve the extinction of the present moral attributes of men, a consummation which " if devoutly to be wished " is certainly not imminently probable. But nations are fortunately truer in their instincts than philosophers in their wisdom. They feel that to secure peace, safety and such happiness as may arrive to the world it is necessary to be prepared for war, and this feeling is the origin of armies.

In all times, then, communities set aside from amongst themselves a section whose exclusive duty it becomes to protect the remainder and to enable them to follow without fear of disturbance or interruption, the various vocations by which in peace, wealth and all its comforts, and advantages are acquired, and to accumulate their results safe from violence and spoliation. This section grows in number, in importance and in power, with the nation to which it belongs. Its rise and growth is the unerring indication of the advancing power of a country, as its decadence, and decline in popular estimation, is a certain presage of decay in the parent state. It forms a class more peculiarly distinctive than any other national subdivision being governed by exceptional laws. It is influenced in great degree by a tone of thought and habit of life fostered by circumstances which pointedly dis-

tinguish it. Its rules of governance are far more stringent and arbitrary, and in all mundane matters, its aims are loftier, and its sentiments more exalted than those of any other portion of the community.

For these reasons the comparatively small section which adopts the profession of arms, universally numbers amongst its members the highest in the social scale of any land, and possesses (in a healthy condition of the body politic) greater proportional influence on a nation than any other constituent. It is true that in the stage of immaturity the church may compete with it for temporal power, and in the stage of decline, the mercantile interest may outweigh its influence on State-craft. But both these conditions are fraught with evil, and public integrity will be invariably seen to tarnish as the warlike sentiment at the heart of the people is seen to wane.

It is therefore the most honourable calling wherein any man can serve his country. Like all other human institutions it is subject to adverse criticism, occasionally just, inasmuch as nothing of man's work is absolutely perfect, but more often most unjust, arising from mistaken or partial views, the shallow prejudices of ignorance and the blind lust of wealth. With the progress of general enlightenment the truth, with respect to this section (in which of course is included all descriptions of armed bodies, sailors or soldiers) will the more and more prevail. Our progress in public estimation has of late years been marked not only in our own country but throughout Europe. It is beginning to be understood that, class for class, there is none more loyal, none more honest and none more intelligent than the army, and we may confidently predict the time when to belong to it will be the highest aspiration of every manly youth in any rank throughout Great Britain.

In considering the art which the soldier sets himself to acquire there is one remarkable principle to be noticed, which distinguishes it at once from any other. It is subject only partially and in its very earliest stages, to any absolute or abstract rules, and the reason is this that the physical causes which can be governed by material means are not the only, nor even the principal agents in war.

For what are styled moral influences are still more powerful in determining its issues. Courage, Fortitude, and in fact Pugnacity are the real disposers of the fate of battles.

Over and over again courage has prevailed against tactical skill, and stubbornness in fight has defeated the most careful and approved strategy, and in the history of no nation does this truth appear more conspicuously than in our own. Were it otherwise, were it a mere matter of calculation of the number of men, of guns, or of horses opposed one to another, the result of a conflict could always be predicted beforehand, but in reality the events of a campaign are often as unexpected as they are important and war has been not inaptly termed a succession of surprises. It is true that the greatest master of the art the world

ever saw, Napoleon ; said that "Providence always sided with the largest battalions," but no man ever falsified the maxim more often than he himself did , and its refutation was never so complete, nor so crushing as in the eventful battle which closed his own marvellous career, the battle of Waterloo.

All soldiers competent to judge, and all writers who have given us accounts of that day concur in describing the array of the French under the consummate handling of Napoleon, as evincing the most masterful and brilliant display of tactical ability ever seen. The commencement of the action was a spectacle like that of some magnificent review. His troops were devoted to his cause and person, they possessed the most implicit confidence in his genius and leadership, they were full of valour and hope, and they were for many hours superior in numbers.

Yet they were beaten. Beaten by patient and invincible fortitude by sheer courage and stern determination.

These then are the qualities that are of the first importance and the highest value to soldiers. They cannot certainly be imparted by instruction, but they can be fostered and strengthened by cultivation and by study of the brilliant examples, our countrymen especially, have bequeathed to us so often. It is impossible to dwell too forcibly on their importance in studying our subject. For the very tendency of study, unless most heedfully supervised, is naturally and inevitably, to magnify the consequence of the special materials it deals with. The purely physical aspects of the art on which the attention is long and closely fixed, will always be apt to engross the faculties.

But as a painter after working at the details of his subject on the canvass, retires to a distance to observe the general effect of his picture, so the student of *our* art must lift his eyes from his drill book, his plans and his treatises, and note from the far record of history the vaster effects and broader coloring of the great moral forces which sway the destinies of War. It is by these means that the genius of the greatest Commanders has been enabled to produce the extraordinary results we read of.

Reverting to the remark made just now, on the calculation of the events of a campaign, on mathematical principles, there was a time when the armies of Europe were really manœuvred as though they were chessmen, when conflict was rarely hazarded, when strategical considerations alone guided the steps of commanders, and when in point of fact a force that was considered compromised by inferiority of position or numbers, actually did surrender or retreat according to fixed rules without suffering defeat.

Our own famous Duke of Marlborough was the first to shatter this system, and his example was successively followed by Frederick the Great of Prussia, and by Napoleon. These great men saw and appreciа-

ted the vast power exercised by audacity in fight. It was far more by this quality than even by the skill which directed it that their victories were gained. These, their swiftness of movement, and their stern deadly eagerness to close with their foe, were the spells which bound victory to their standards. And it has always been so.

Perhaps one of the most remarkable instances that can be cited of this truth is the career of Lord Clive. He was noted as a boy at school as being " out of measure addicted to fighting," and his subsequent life in India may be most accurately summed up in the same words. One of his battles well known by name, that of Plassy, is so forcible an illustration of this portion of my argument, and is so graphically described by the historian Orme that I cannot resist the temptation of trying to exhibit it to you.

In Volume II, Page 172, he says.*

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This is one of the most brilliant examples on record of valor and enterprise, for although, as is shown in the narrative, treachery and dissension in the enemy's camp aided the results of the victory, it is certain, that had any weakness shown itseif on the British side, had any reverse occurred to them during the action, the traitor Meer Jaffir would have infallibly taken part against them. It is therefore to the heroism and dauntlessness possessed in an inordinate degree by Clive and his handful of followers that we must ascribe the success of the day which founded our Indian Empire.

Remembering this always ; the next step in our study is to learn to employ these great moral forces in the manner, which will place them most at an advantage, so as to waste nothing of their power and to give them in fact the most favorable opportunity of manifesting themselves.

Now in approaching this part of our subject, we must observe the extraordinary number of considerations which it is requisite to keep perpetually in view in order to place an army in the Field in a thoroughly efficient state. This renders the science of War simple as it is in principle, in practice one of the most complicated problems ever offered to human ingenuity. It is not too much to say, that an army really complete, is an Epitome of the State and that its government, guidance, and maintenance include in one grasp, all the intricacies of national administration.

To aid the imagination in taking a comprehensive view of the matter we will first view it, as presented in a rudimentary state.

Suppose two men to quarrel and as a consequence to fight. In the struggle one finds himself inferior, we will say in bodily strength, yet

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* The extract is omitted here to economize space. The Work is to be found in all our Regimental and Station Libraries.

he may be more active and thus be enabled to keep his adversary from closing, and to prolong the conflict. Being swifter he may seek to postpone the fight and by biding his time and opportunity, to re-assail his enemy at an advantage. He may surprise him sleeping or unarmed and unprepared. He may lie in ambush for him, he may steal his food and weaken his foe by hunger, he may arm himself after a superior fashion, or finally at some supreme moment he may prevail by sheer passion and zeal for the fight.

The parallel will be found to hold in the quarrels of nations as in those of individuals. But when large numbers of men are actuated by a common motive, and attempt to combine their efforts in order to accomplish together a purpose shared by all, another element springs into existence. It is clearly essential that, in order to gain power by adding the strength of one man to that of another, the efforts of both, should be put forth simultaneouly, otherwise nothing is gained. For instance, if two men pull at a rope, but not at the same instant, the one making his exertion at the time the other ceases to do so; then the effect produced is plainly that of one man's strength only. It is when at a given signal both pull *together* that the added power makes itself visible. Similarly when the combined force of many thousands of men is to be concentrated on one object the combination can only be effected by some arrangement which shall give a common and simultaneous impulse to all their acts and movements. And this arrangement in armies is called Discipline.

Discipline is therefore nothing more nor less than concerted action.

All its rules and observances are simply the means whereby the power of very large numbers of individual men is accumulated and welded into a mighty force. The more perfect the discipline, the more absolute the unity which prevails throughout the mass, the stronger the army and the more formidable the nation of which it is the bulwark. This then is the second great quality, we have to observe, Courage being the first—the Soul of War. Discipline is as the brain which gives it movement, direction, and unity.

But while it would be difficult to insist too strongly on the absolute necessity of immediate and implicit obedience to orders, which is the essence of discipline it should never be forgotten that its subjects —we soldiers—are not inanimate instruments but are intelligences capable of independent action, which may be of the highest value, when employed not antagonistically to the common object. It by no means follows that because obedience must be implicit that it should also be blind. On the contrary it is a great additional strength to a force that each individual composing it should appreciate the object sought, so that where orders cease the understanding shall take up the matter and work for its fulfilment.

Drill for instance is that item of discipline which rules the actual

setting in motion of the men of an army. It is obviously more essentially dependent upon exact and instant obedience than any other portion of a soldier's duty. Yet even here, intelligence though suspended in its active exercise, to any greater degree than is necessary to understand the words of command—should never be absent. And if this is true now, it will be truer still of the future.

Within a comparatively recent historical period the bulk of the English Infantry, famous then as now for steadiness in action, was armed with pikes and spears that could of course be used only in actual hand to hand combat; the light troops, (answering to our modern skirmishers) were archers armed with bows and arrows.

The English bowmen were renowned throughout the world for their skill in the use of these weapons. The archer was said to carry three men's lives at his girdle, alluding to the number of arrows he carried and the almost certainty with which each shaft would strike down an enemy. But in these days it would be scarcely exaggeration to say that a cool and skilful soldier carries as many foes' lives in his pouch as he has rounds of ammunition. The ever advancing superiority of modern arms, the great improvement especially in the infantry soldier's peculiar weapon, the rifle, the great increase of skill in its use noticeable from year to year—its great range and rapidity of fire which have enhanced the need of individual intelligence for its effective use, all these circumstances combine to render it extremely probable, that movements in column, those by which one man's word can direct the motions of thousands, will be in progress of time unavailable in the field; that even lines will be greatly expanded, so as to enable each soldier to employ his fire to the best advantage, and in lieu of seeing actions fought as heretofore by great masses in restricted space, under the immediate leadership of one commander we shall find the great battles of the future, will be fought over most extensive areas of country in succesive series of elastic lines.

In such situation any over-proneness to what is called centralization, *i, e.* the accumulation into one hand of all immediate executive authority would be a great evil. The plan of a campaign, and the design of a battle must emanate as ever from one brain, but the achievement of each step of progress, and the gaining of each rood of battle ground must be the work of the bravery and intelligence of the private soldier.

But it may be asked whether implicit obedience can be compatible with independent and intelligent action. How if the intellect of the subordinate tells him that the commands of the superior are unwise, and likely to be disastrous in their consequences? The answer is simple and is contained in an expression used above.

Where orders cease, the understanding should commence. Orders should be regarded as directed by circumstances of which the recipient may have no knowledge, or an imperfect knowledge.

When they are contrary to his notions of right and wrong, they should be looked upon in the same light with regard to his will, as would any insuperable natural obstacle appear to his movements. A man, for instance, desires to enter a certain town which seems near to him : he finds his direct path to his object barred by a wide ditch and a high wall. He would naturally skirt these till he should arrive at a bridge and gateway whereby he could pass in. It cannot be said of him that he is, in doing this, acting against his intelligence, because the road may be a long way round from the point whence he started to that he wishes to gain ? In the same manner he should regard orders which he cannot comprehend as imposed by some necessity which he does not perceive, which stands in the way of the (to him) apparently direct road to the object sought, and he should consider that to contest the instructions of his leader or to disregard his orders would be simply tantamount to walking blindly into the ditch.

In this way the most complete and absolute discipline may nevertheless be perfectly compatible with the highest intelligence, and indeed the more intimately these conditions blend, and supplement one another, the more formidable the power they create.

The soldier then should never allow himself to fall into the delusion that he is a cypher or mere machine, irresponsible and unthinking, or encourage himself in habits of idleness and want of reliance on himself because he has to obey orders which enable his comrade's exertions to combine with his own for their common advantage. If he himself should never fall into this error assuredly his superiors should never do so. In the illustration used it is clear that if the man were not treated as a rational being, were never told that there was a town behind the ditch and wall, and were not informed that he was to enter it, the bridge and the gate would have no significance for him and he would pass them by.

In truth like every other earthly virtue discipline itself may be carried to a vicious and mischievous extent, if it be suffered to impair the power which it should aid, and which reason confers on man.
This should be guided but never destroyed.

Not unfrequently instances have occurred in warfare carried on in wild and barbarous countries where dense forests and dangerous morasses impede movements and forbid combined action, where our brave and most highly disciplined troops have suffered disastrous reverses. These have generally arisen from too rigid an adherence to rules excellent in their way, but not adapted to the special position. The men have been *too* exclusively taught to rely on their united strength, so that when natural obstacles prevent their union, as will happen in dense jungle they have been unable to make the best use of each separate individual strength or skill, and have fallen before ignoble foes.

This brings us to the third great point for our consideration. If courage be the soul, and discipline the brain of an army, the muscles

which they rule, the members that compose its body, must be trained, strengthened, and moulded to their work.

Education, or the acquisition of knowledge is of two kinds, that which is learnt from the experience of other men, hived as it were in books and stored away for future use; and that which is learnt by every man from his own personal observation. As the stock of information to be acquired by this latter process, is absolutely inexhaustible, the man who adopts it will, if of average capacity and energy, probably in the course of his life, make some kind of original discovery which shall serve to augment the general stock of human know ledge. That too which a man acquires is generally far more distinctly remembered, and is more distinctly gained than by the study of books. But on the other hand no man's life is long enough in the present stage of human progress to enable him to dispense with those great facilities in gaining knowledge which books offer. In them vast stores of information are brought together into small compass of space and time. The experiences of a life time are conveyed in an intelligible but highly concentrated shape to other minds by means of a few small volumes which may be read and mastered in a few weeks or months.

To speak figuratively books may be likened to the paths, which our predecessors in any given direction, have made for us; enabling us to pass easily and rapidly over an explored country to a point whereat our own labors may profitably commence; without them, it would be as though we were compelled to hew our own way at starting, and were to reach finally a place which had been passed long before. While on the one hand, the mere scholar and exclusive student of books is apt to become a pedant and a trifler, seeing little of the real purpose and beauty of life's journey, the utterly unlearned man on the other hand never gets far enough, or high enough, on the uphill road to see any except the very nearest objects.

If the book worm then is liable to form erroneous judgments the thoroughly ignorant, are incapable of any, so the two methods of education should be combined, and if a man should read, and listen, still more should he watch, observe, and ponder in his mind the lessons which his eyes will continually present to his notice. To no class, does this truth apply more conspicuously than to soldiers. For to us no kind of knowledge comes amiss, no species of information is so trivial that it may not serve us at some time or another, no views however extensive are so broad that they shall not contain land-marks for our observation.

We have seen that an army is an epitome of the State; its necessities are so innumerable and so urgent, its interests involve so many varied considerations, its organization includes so many departments, that there is hardly a calling which is not represented in its ranks, and scarcely a gift or an acquirement which a man can possess that may

not be turned to its advantage. The draughtsman and the laborer, the miner and the musician, the engineer, the clerk, the doctor, the accountant, the mathematician, and the lawyer all find their places in our community. Indeed, the exigencies of the profession often demand, especially in war, that many of the qualifications for these vocations shall be combined in one individual, and the number of trades that an old soldier or sailor can turn his hand to at a pinch, is proverbial.

A soldier then should let nothing escape his observation. As he is perpetually finding himself in novel and unexpected situations, so he should emerge from every one with some gain to his knowledge. As he, alone of civilized men is liable at any moment to discover that his life, and the lives of many others are in his hand, and dependent on his promptitude and skill, so he of all men can least permit himself to neglect the acquisition of any scrap of useful information.

The shepherd draws his knowledge of the weather which so materially affects the safety of his charge, from the faintest signs in the air and heavens, from the varying tint of the cloud, from the straw which marks the eddy of the wind, and from even more impalpable things; the hues of the distant hill, or the murmur of the stream as it falls on his ear, all these things have a significance for him and by which he may foretell the coming sunshine or storm.

The hunter too notes almost instinctively the slightest indications in the forest which betray the path of his prey, a broken twig, a leaf turned aside, a blade of grass whose edge has been barely gilt by the tinge of blood, the accent in the note of a frightened bird; these and such seeming trivialities are his guides, and the soldier in the exercise of his craft must be as watchful and wary as these.

War teaches her lessons right well, but something sternly, and he who would profit by them must have the eye and the ear of the shepherd and the hunter, with a heart and soul, all his own, the first that can never despair—the last that must aspire.

So far the ground is clear before us, but to our limited human natures and capacities no doubt a great number of problems which we cannot answer, present themselves. In such cases it is well for us if we can accept the doctrine of discipline as we considered it just now, believing that where our intelligence fails us, faith and ready obedience will guide us safely to the end. The question occurs to most of us, and will occur to men as long as the world lasts, why Force should be thus, as we have seen, the base of its condition.

> Why should Life be cruel and why should Death
> Wait on each instant's course o'er the world's way,
> For all the myriads that drew their breath
> In rage or terror, preying or a prey?
> All live by other's pangs, pursue and slay,

While Hunger watches with a savage stare
To waste and still to crave and ceaseless sway
Who most destroy are strongest and most fair,
And pleasure's dearest haunt, is Rapine's crimson lair.

We wrest our baubles from some weaker hold
And no delight we own but has been bought
At price of other's suffering. Our gold
Is human agony stored up and wrought
In the red furnace of our strife. All thought
That is not sordid and that we deem brave
In rooted deep in love. The battle fought
That all must lose in turn, that none can save
Thus still the greenest herbage grows above the grave.

It speaks imperfect knowledge. But escape
In all this stern inexorable scheme
Throughout the universe in any shape
Is not, nor can life alter like a dream
Nor our reluctance stay the mouthless stream
That rises not on earth, nor sleeps on sea
But rolls its tide where all the ages teem,
With torrents swelling hoarse in agony
Of changeless acts, the atoms of Eternity.

No! the broad records of the Wrong and Right
Are blotted never. As the signs in Heaven
That the All-grasping Hand doth fadeless write,
Upon the mighty scroll with flame engraven
In tracks of all the suns wherewith is paven
This vault that pens us. They will never change
If human eyes be weak or hearts be craven
They are not false, nor their great prospect strange
Because we cannot read, who dare to re-arrange?

VI.

Camp Lessons: The Native Officers of our Indian Army.

AMONG the many imperfections in our military system which the camp of exercise brought to light, few came so prominently forward as the incompetency of our native officers and their inability, we speak generally for there are many exceptions, to carry out satisfactorily the duties which they were reasonably called upon to perform. It will be the endeavour of this paper to satisfy all as to the correctness of the above statement; and also to suggest some remedial measures of a simple and practical nature. And we make no apology for introducing this subject, as it is one on which the Council have called for a paper, and it is a question of great moment to the efficiency of our native forces.

We must, however, before discussing the competency, or otherwise of the native officers, understand what their position really is in the native army, and what are their real duties; and to understand this we must look back to the system which gave us native officers. Previous to its re-organization, the native army was officered by British officers and its companies commanded by them, there was also an establishment of non-commissioned officers, and in these two respects the organization was similar to that of the British line, and the interior economy of a native regiment was carried on on the same system. There existed, in addition, in the native army a class and rank standing between the British company officer, and the non-commissioned officers styled 'native officers,' receiving commissions, a superior social grading and higher emoluments. The duties of these native officers were few and simple; they were called upon to command companies on parade in the absence of British officers, to exercise a limited, almost nominal, authority over their companies in the lines, and to watch the interests of those under them, thus forming an additional link of communication between the sepoy and his commander, they were also expected from their superior and more isolated position to be free from the partialities common to non-commissioned officers living in daily intercourse with the sepoys, and to advise the British officers on matters connected with the social habits of the men. No technical responsibility devolved upon them, for beyond that of reporting signs of disloyalty or disaffection, the British commander was alone held directly responsible to his commanding officer and the government for all matters connected with the well-being and discipline of his company. So anomalous a position was thoroughly appreciated, and the recipient of the native commissions, in casting aside the daily duties and troubles of the non-commissioned grade fell gradually into the state of blissful ease and ignorance which was more or less intended to accompany what the promotion really was, a reward for long and faithful services.

Now, so long as the commission was considered as a reward and, no

executive responsible duties were attached to the office, no possible objection could be taken to it ; on the contrary, it was much to be commended, for it removed from a sphere of activity a non-commissioned officer whose decaying mental and physical energies were gradually unfitting him for active duties ; it rewarded with comfort and honor a deserving soldier ; and it gave to every recruit of the Company's armies the greatest possible incentive for good behaviour and faithful service in the pleasing prospect of ending his days under the grateful shade of his village fig-tree, the honored recipient of a liberal and guaranteed pension. But a time came when, after the Mutiny of 1857, it was found necessary to re-organize the remnants of the native army, and to raise therefrom another army better suited to the requirements of the State, and less liable to a disaster similar to that which had overthrown the old ; and foremost among the changes was the introduction of the so-called irregular system with the reduced establishment of British officers. This change caused no departure from the original model on which the old native army was organized, for, as in the British so also in the native army, there still remained two classes of officers—staff and company ; but where in the former native army both classes were recruited from the British race, and an additional native class existed, now in the native army the staff of the regiment was alone to be recruited from the British race, the British company officers disappearing to be replaced by the class of native officer recruited from the natives of India. What then would be the duties of the new class of native officers according to the spirit of the change ? and are we wrong in assuming that in replacing the company officers they were to accept their duties, and forgetting the ease and repose of their former position take up the responsibility and exhibit the zeal of the British officers whose places they were to take. This we think is incontestable, and there can be but little doubt, but that the true meaning of the change was to make the native officer the veritable 'company officer,' and give him a position analogous to that of the company officers of a British regiment.

Beyond concurring in the justice of this measure, it is not within the scope of this paper to discuss its policy, but it is fairly so to temperately inquire, whether the sense of the measure has been rightly understood and strictly enforced ; and herein it is a matter of regret to state that the results of such an enquiry are disappointing. The Camp of Exercise at Delhi too clearly showed that the extent of the change has not been appreciated by all to whom the carrying-out of details of organization are naturally entrusted, and this may in most cases be attributed to a too rigid adherence to the traditions of the past, too great a reluctance to admit of pre-conceived ideas as to the impolicy of the change being bent to give sufficient trial to the new system, and in some instances the material at disposal did not admit even of the trial. Here and there an attempt had been made to assimilate the position of a native officer to that of a company commander ; but in the greater majority of cases the native officer was still the nonentity he ever was. In all cases, however, the duties of command and detail devolved more or

less upon the British staff officers in addition to their primary and more important duties of instruction and supervision. So much is this the case in the native army that at the camp of exercise the scarcity of British officers was at once felt in the native army; and so much was their time taken up in regimental details that few could be spared for the instructive duties of the staff, reconnoitring, &c., and so slight was the assistance rendered by the native officers that they were almost considered an incumbrance to a regiment. No trust or confidence was placed in a native officer, not even to the extent of expecting him to perform unaided the simplest duties which any British non-commissioned officer would be thoroughly acquainted with. Had a picquet or even a sentry to be posted, it was necessary for a British officer, and often a field officer, to go and do it; was it necessary to detach a company or a half company to protect the flank of a column or to search a wood or a village, a British officer must accompany it; no line of skirmishers, no advance or rear guard, no small detached party, no picquet, not even a few files, could be left in charge of the native officer; the construction of the smallest and simplest defensive work required the supervision, and often the personal labor, of a British officer: yet all these duties can fairly be expected from a company officer of ordinary intelligence and reasonable experience. There was scarcely a day that the uselessness of the native officer was not in some form apparent; not a parade but that a call was made for a British officer to perform what would in the days of the old native army have been performed by the company officers. Further, it was clearly shown how very dependant every native officer was on the few British officers of his regiment, how utterly helpless and void of expedient he was when left to himself, and what was likely to occur if any unforeseen chances deprived him in a moment of emergency of the orders, not the advice, of the British officer.

In justification of this setting aside of the native officers, it may be urged, and very rightly so, that the native officers were unfitted for these various duties, and that in the short duration of the camp to descend to such generally-required individual instruction would have been beyond the powers of the divisional commanders and their staff. To refrain on the other hand from employing the British officers so as to ensure a correct working of the details, would have marred the success of the manœuvring and defeated the objects of the camp. In justification also of the native officers, let it be said, that their ignorance is the result of want of opportunity and want of instruction. From a life of ease and indolence they have been placed in a position of responsibility without any preparatory training or subsequent education, is it therefore a matter for surprise if when tried they are found wanting? The arguments on both sides are unanswerable, but to continue them would prove fatal on service if many casualties occurred in the British ranks. A change is inevitable; either we must revert to the system of the past, or we must gradually select and train our native officers for the position we wish them to hold. Let us select the latter alternative.

We are aware of the arguments likely to be brought up against what we counsel: the impossibility of training a native into an intelligent company officer; the absurdity of ever expecting a native officer to be other than a mere machine; the want of talent or education: the generally indolent and careless habits of a native; the danger of entrusting a native officer with too much authority, etc., etc. These with the exception of the last which can easily be watched, are but traditions, the last signs of a doggedly conservative adherence to the customs of bygone ages: to perpetuate them is to ignore the history of this empire, and to combat them it is only necessary to consider what excellent and faithful service is performed by natives in all the other departments of the state; a simple reasoning by analogy would prove that the rudiments of the military art and the technical duties of a company officer are quite within the grasp of the intellect of an ordinarily intelligent native. The necessity also of having good company officers is daily becoming more clear; it is a fact acknowledged beyond dispute that the perfection of an organization depends much upon the careful training of its subordinates; that the success of military operations is greatly enhanced by the trained intelligence of the inferior officers, and we see with satisfaction the efforts made at home and abroad to instruct the regimental officers, and the cheerfulness and zeal with which the appeal to study is responded to: yet with all this before us we are leaving a cruelly weak point in the weakest part of our armour. We feel that some endeavours are being made to improve not only the class but also the intelligence, of our native officers; but having adopted the system of substituting native for British officers, we think something more general should be carried out, and an authoritative system organized with the view of obtaining and training good company officers. Two conditions we consider essentially necessary: 1st, That it should be impressed upon the minds of all in authority that the British officers of a native regiment occupy solely the position of staff officers, attached to the regiment for purposes of instruction, supervision, and example; and the native officers are the *bonâ fide* company officers. 2nd, To insist upon every native being physically and mentally fit for his position; and that the native officers commanding companies are at all times able to *command their companies in any position in which they might be placed.* Both of these conditions are imperfectly fulfilled in our present army.

The position of a native officer may be easily defined by authority, but unless he proves himself at all times equal to the duties of his rank he will never be entrusted with them, or, in other words his true position will never be acknowledged. To ensure this primarily it will be necessary to modify to a great extent the system upon which promotion is now made. It must no longer be a matter of seniority, or a case of rewarding long and faithful services, for these other rewards must be found: it must be a system of pure selection, the selected non-commissioned officer must be the most intelligent and smartest of all of his rank, the best acquainted with his duties

and the best instructor, the man who by his conduct and zeal gives promise of still greater energy, application and fitness for responsible employment ; he should also be of an age which will admit of the best years of his life being passed in the commissioned grade. Promotion should be considered the exception, not the rule, and though for a time such a ruling might cause some discontent among the disqualified candidates ; the qualifications necessary for the higher grade will incite the majority to compete for the prize, and the others to be satisfied that it is beyond their reach. In carrying out this system, it would run much chance of failure, and would command no confidence, if left to the arbitrary discretion of commanding officers, and to obviate this we would strongly recommend the introduction of station boards of examination, similar to that assembled from time to time to test the fitness of British officers for their promotion, to be composed of selected officers, and to test the candidates critically, both by verbal and practical tests, according to such rules as the military authorities may decide. These examinations should be of two standards, the lower to pass candidates for the commissioned grade, the higher to qualify them for promotion from the lower to the higher grade, they should, in the first case, comprehend a practical knowledge of elementary and company drill, the construction of fascines, gabions, rifle pits, shelter trenches, &c., a thorough knowledge of the duties connected with the interior economy of a company, and the duties on guards, picquets, sentry, &c. ; in the second case, the examination in drill should be more searching, and embrace battalion drill and outpost duties, it should also test the candidate's knowledge of the articles of war and the standing orders of his branch of the service, and it should ascertain his knowledge of the tracing and construction of simple field works, the defence of houses, posts, villages, bridges, &c., in both cases a knowledge of reading and writing in one language, Oordoo or English preferred, should be insisted on as well as a good knowledge of arithmetic. Candidates for the commissioned grades, once they had passed their examination, should be considered eligible and entitled to succeed to vacancies by seniority subject to certain conditions of conduct and age ; similarly once appointed, independent of the examinations the further promotion should also be subject to certain conditions of conduct and age.

Once commissioned, the young native officer should not be left to his own resources, but rather made to feel that he was undergoing a period of probation ; every opportunity should be afforded him of gaining instruction, and every encouragement given him in learning all points connected with his duties. In each division a native class might be attached to the classes of garrison instruction at which all junior native officers should be sent to gain the practical knowledge of tracing field works, and to accompany the British officers when reconnoitring, so as to learn the points which should be noted in the event of their ever being called upon to make written or verbal reports when sent to examine a country more accessible to native than British officers, valuable in-

formation might often be gained through the medium of native officers, many of whom have natural talents well fitting them for an intelligence department, which talents would be greatly assisted and developed by a little methodical instruction. It would also add very greatly to the success of the above system, were direct commissions given in a small proportion to intelligent native youths of respectable families, and to improve the position of the native officers by the grant of a command allowance to those actually commanding companies, and by readjusting and enhancing the rates of pay of the two different grades. The former could only be possible by the formation of a cadet college, which need not be expensive, where the youths could be trained, and from which they could be gazetted to regiments of their own caste and nationality; and the latter might be advantageously arranged for by the reduction of the number of companies from eight to six, and a corresponding reduction made in the number of native officers, and to a modified extent also in the non-commissioned grade. No harm need be anticipated from this measure, provided, the effective strength of sepoys is not reduced, for, in many respects six companies of one hundred sepoys each are more convenient tactically than eight companies of seventy-five: and it could not be denied that a lesser number of highly trained men would be far more useful to the State than a greater number of men who cannot be trusted out of the reach of a British officer's voice.

It may also be urged against the proposals contained in this paper, that it is impolitic to train natives to any extent in an art which at any time they might use against us, but with regard to the training of a native force all ideas of disloyalty and infidelity to the colors must of necessity be set aside. If a native army is to be kept up at all, it is an undoubtedly sound policy to ensure that in discipline armament and efficiency, though not in numbers, it should be equal to the troops with which it may be called upon to act; otherwise, by disregarding the warning of a distinguished foreign general, that the indiscipline of inferior troops extends to the superior, the stability of our British troops might be engendered if called upon to stand side by side in line of battle with men from whom they could derive neither moral nor physical support. Besides which, if such an argument were sound, it would be simpler and cheaper to reduce the native army into orderlies and watchmen.

FANTASSIN.

SELECTIONS.

I.

The Game of War.

On Wednesday, (March 11th,) Prince Arthur delivered a lecture at the Garrison Instructor's Class-room, Dover, on the "Game of War," It consisted of a remarkably lucid description of the German "Kriegspiel," and was designed to excite an interest in the subject among his Royal Highness's brother officers in the garrison and district. Among the officers and gentlemen present were Sir Howard Elphinstone, K.C.B., Lieutenant Fitzgerald, Colonel W. Parke, C.B., Commanding at Shorncliffe; Colonel M'Donald, Assistant-Adjutant-General; Colonel Mayne, Assistant-Quartermaster-General; Mr. A. W. Downes, District Controller; General Dalzell; Major Blenkinsopp, Superintendent of the Riding Establishment, Canterbury: Major Crookes, Mr. T. Humphreys, &c.

Colonel M'Donald, as President of the Dover Association for the discussion of Military subjects, introduced the Royal lecturer. He said he hoped he might be permitted to observe that the honour his Royal Highness had conferred upon them by being present on that occasion, and by his introduction of a subject known only by name to most in that assemblage, would give a stimulus to the institution it had never hitherto possessed.

Prince Arthur, who was received with applause, in opening his lecture, said he had no doubt that many present had been asked. "What is the Kriegspiel, and how do you play it?" He would endeavour to answer these questions as briefly and clearly as he possibly could, and if they would follow him through some details, which he hoped would not prove wearisome, he felt sure they would agree with him that the game might be of the greatest use to all who were desirous of earnestly studying their profession. They must not imagine that it was an amusing game, not such a recreation, for instance, as chess or whist. The Kriegspiel was really a study, and a complete study, of the art of war, and to play it properly required great attention, while to act the part of umpire close reading and hard study were necessary; one, in fact, required to be an adept in the art of war. He must remark that the game was not a novelty. On the Continent it had been used for a great number of years. It was invented by a civilian after the peace of 1815, and was subsequently worked out carefully in all its details by his son, a Prussian officer of Artillery. In 1824 Marshal Muffling, the companion and friend of Wellington, spoke of it in the highest terms of praise. Some 29 years ago, a society of officers was formed at Magdeburg for the special object of playing the game, The chief of this society was Von Moltke, who attached great importance to it. To attempt a full explanation of all the

rules would occupy far too long a time, and would, he feared, be wearisome. He would, therefore, only explain the general principles which concerned the game. They were simple enough. During the late war most of them, he supposed, followed the movements of the armies by placing pins on maps to represent the different bodies of troops, and thus got an excellent idea how matters stood each day. The game of war was simply an amplification of this; instead of pins leaden blocks were used, and these blocks were cut to scale so as to suit the maps and show the exact disposition and space occupied by each arm of the service as well as the direction in which they were moving. His Royal Highness then, by the aid of diagrams explained the disposition of the troops used on either side in playing the game, observing that the maps used in the game were drawn on a large scale, so that each small movement could be clearly shown, and every inequality of ground or obstacle taken advantage of, as it would be in actual warfare. The blocks used were red and blue, the two colours representing the opposing forces. The Prince produced one of the maps used in Prussia, on a scale of eight inches to the mile; the Austrian maps were upon the same scale, but English ordnance maps were on a scale of only six inches to the mile. In order, however, to make use of these maps, the War Office were now engaged in getting leaden models of troops, of a size suitable to this scale. He understood, also, that it was intended to issue shortly a set of maps and models to each military district. His Royal Highness pointed out a remarkable peculiarity in the Austrian map, the pieces composing it being turned in any direction one pleased, yet always fitting, and thus enabling the players, while using the same maps, to change the features of the ground. In explaining the principles of the game, the Prince said that two persons were chosen to take charge of the opposing forces, a third acting as umpire. The two players or opponents need not be very learned. All that was required of them was that they should know what the different blocks were, be able to read a map, and have all the knowledge of the principles which governed the marches of troops, their disposition in action, &c., and, lastly, that they should yield implicit obedience to the decision of the umpire. The umpire, on the other hand, should thoroughly understand the theory and practice of the art of war, and know perfectly all the rules of the game, so that he could apply them at once to any case that might occur. Before commencing to play, the umpire issued a "general idea," stating the nature of the operations and the general object which each side is endeavouring to obtain. This should be done a day or two before the game began in order to give officers sufficient time to study the map. As an illustration of this "general idea" his Royal Highness supposed an invading army had landed and established itself at Hythe, and while pushing rapidly on towards London detached a corps to mask Dover and Chatham; the troops in the south-eastern district were concentrating in Dover for a combined attack on flank or rear, so as to cut off the enemy's communication with Hythe. Besides this a "special idea" was given to each commander to guide his own individual moves, for instance, Colonel M'Donald, who had kindly

undertaken to defend Dover, had received the following special idea. The troops in the south-eastern district had had time to concentrate, and numbered about 11,000 men, as detailed. They were to advance from Dover on the 13th of March and take up a position on the high ground in front of Hougham and Alkham, and to throw out their outposts as far as Swingfield, Evendean, and Stanley. During the night of the 13th the General commanding hears from trustworthy reports that a strong force of the enemy is advancing upon Dover by the road leading towards Hawkinge, Evendean, and Swingfield. The General is to take up the strongest defensive position near his outposts, and to hold it until assistance arrives. After describing the laws of the game, his Royal Highness, before closing, mentioned a few instances to show how closely the game, in its application, approached to what would occur during operations carried on in the field. For instance, a report is sent in from outposts that the enemy is advancing. The Commander cannot immediately give his order to the troops because the laws of the game state that the aide-de-camp cannot carry orders more rapidly than at a certain pace. He must, therefore, wait for a certain time before he can remove his pieces. He might make use of signalmen; but the rule is that, unless he has given written orders for the signalmen to be with that corps, time must be allowed for the aide-de-camp to gallop over that distance. Secondly, an officer orders his men to "double," so as to take cover in a wood. The umpire forbids him to "double" more than 200 yards at one move, and never more than three times in eight moves. Should they be attacked immediately after doubling they receive one chance less than is due to their strength, as they are not then supposed to be so efficient. Having said all that time permitted in explanation of the game the Prince recommended the study of it to all who were anxious to improve themselves in a knowledge of the operations of war, and resumed his seat amid loud cheers.

The following remarks are extracted from the "United Service Magazine" for February 1872:—

For the benefit of those who have not seen the game played, the "Kriegs spiel" may be defined as the representation of some definite operation of war on a plan drawn to a large scale, upon which, instead of the troops, certain movoble signs representing them are made use of.

The first requisite for playing the game is to have good maps, on a scale of eight inches or more but not less than six inches, to the mile, all the natural features of the ground, the hills and the valleys, the villages and roads being shown to scale on the plan. The steepness of a hill, and consequently its practicability for the ascent of the different arms can be judged of from a look at the map, by those acquainted with the system of *contours* or the lines where horizontal planes at fixed vertical intervals apart cut the surface of the ground. The hills are shewn to "scale of shade" on Muffling's principle.

These maps are cut in squares of about eighteen inches, and are mounted for convenience on cardboard, so that as many as are required to take in the ground which is to be the scene of the operation, can be placed on the table.

The troops are represented by oblong blocks of lead of different dimensions which are printed on the upper surface according to the conventional signs for representing troops. They are constructed to the same scale as the map, so that a battalion in line represented by a block of lead occupies the same extent of front on the map as the real battalion would on actual ground. So with smaller bodies, such as companies, squadrons, down to single outposts, and vedettes, each has a special block of lead to distinguish it. To distinguish the opposed forces one set of blocks is painted red, the other blue. The front or rear, as the case may be, is also shown.

A scale corresponding to the map, a pair of compasses, and a die comprise all the apparatus necessary.

For the carrying out of a small game, that is to say, of a minor operation of war, as the reconnaissance of an enemy's position for instance, three players are necessary. One to conduct the game occupying the position of umpire or referee, the other two to command the contending forces. In a larger game the chief umpire would be assisted by sub-umpires, and the commanders of forces by troop leaders, &c.

The players being assembled, the chief umpire, or instructor gives out the "general idea" (of a similar nature to that given at the Autumn manœuvres,) fixing definitely the position of the troops in the theatre of war with reference to each other, their bases, lines of communication, &c., such information in fact as would be known to the troops in real war. Each commander then retires to his own room to consult his map, and to receive from the umpire the "special idea," (the subject of which is of course unknown to the opposed commander), defining the *object* he has to effect, the force at his disposal, &c., &c. The umpire receives from each in writing the disposition of their forces to effect the *object*, which enables him to calculate where and when by the ordinary rate of march the two forces would sight each other. To avoid long operations out of range of one another, he fixes this time for the commencement of the game.

The following are copies of the "general" and "special ideas" of a game which the writer recently witnessed at one of the upper military schools in Berlin. The officers conducting the operation had served about four years in the army, during which they had taken part in the campaign of 1870-71. It will serve to show the mode of procedure in conducting a game.

General Idea.

"Situation of affairs as on the day before the battle of Prague 6th May, 1757. The Austrians in position on the right bank of the Moldau.

The King of Prussia had crossed the Moldau and was at Dablitz on the evening of the 5th May; Field-Marshal Count Schwerin at Brandeis.

SPECIAL IDEA.
(For Blue Prussian).

"At 6-30, A.M., on 6th May, the King had joined Schwerin at Gbell. The troops are ready to move forward in the direction of Wissoczan, Hloupetin and Keyge.

"A detachment on the left flank (Northern detachment), under Major A. consisting of

1 Battalion Infantry.
1 Company Rifles.
1½ Squadrons.
1 Battery.

receives orders at Sattalitz at 6.45 a.m., on 6th May, to move off and reconnoitre beyond Hostawitz, the enemy's position, which was supposed to be between Keyge and the Ziskaberg."

Problem.—Orders for the march of the detachment-commander.

SPECIAL IDEA.
(For Red Austrian).

"The Austrian Army will oppose the enemy's attack holding the position between Keyage and the Ziskaberg.

"A detachment on right flank (Southern detachment) under Major B. consisting of

2 Companies Infantry.
1 Company Rifles.
1 Squadron.
4 Guns.

arrives at Hostawitz at 8 p.m., on 5th, with the object of defending the defiles there against any enterprises on the part of the enemy, and of furnishing intelligence about the enemy early on the following morning."

Prob'em.—(1) Written orders for the evening of the 5th. (2) Verbal orders for the next morning.

In compliance with the "special ideas," each commander gave in his written orders. The Austrian commander placed his out-posts on the evening of the 5th, as he would have done in real war, and these retained the same positions on the morning of the 6th. The Prussian commander moved from Sattalitz as ordered. His disposition for the march and the position of Austrian outposts were scrutinised by the umpire with reference to the *object* each commander had in view.

The umpire then decided when the troops were in sight of each other, and therefore what men should be uncovered and placed on the map. The game then commenced. Each commander in turn stated his next move; if he said, "I advance towards the enemy," his troops, which were decided to be in sight of the adversary, were moved on the map over a space equal to that which they would pass over *in two minutes* on actual ground. The *pace* at which they are to move is also stated, and provided it agrees with certain rules laid down on this head, is not interfered with by the umpire; of course, for instance, a commander would not be allowed to *double* his troops for several consecutive moves, without moving them at a walk occasionally. Troops out of sight are likewise advanced, but they may be covered by the hand to conceal the design. The game went on by moves until the outposts met, then the advanced guard supported by the battery became engaged; and ultimately the weaker detachment retired.

The reconnaissance involved the passage of a defile in presence of the enemy; the attack and defence of a village and the use of a wood in protecting the retreat were exemplified and carried out by the players with great intelligence and knowledge of the employment of the three arms.

The umpire then called for opinions from the bystanders, and afterwards criticised the operations himself.

The "moves" are based upon the distance over which troops march in two minutes, which are laid down in the Instructions for the Game as follows;

"*Infantry.*—March along a road 175 yards in two minutes; in engagement, 200 yards; at double, 300 yards, (this can only be done for three out of eight moves, and after each move at double there must follow at least two moves at the ordinary pace,) in thick wood. 80 yards."

"*Artillery.*—15-pounder field battery marches 175 yards; in engagement, 200 yards; in urgent cases 500 yards (two moves out of ten); galop 700 yards (one out of ten) in two minutes."

"*Cavalry, Horse Artillery.*—March, 175 yards; in engagement, 200 yards; trot and walk, 350 yards; trot, 500 yards (for ten moves, then five moves at engagement pace); gallop, 700 yards (two out of ten;) charge, 750 yards in two minutes.

These rates are modified in certain cases, and must be determined by the umpire, as for instance in the case of bad roads, marching by night, or over steep ground. "In tolerably open woods cavalry and infantry can move over 175 yards in two minutes. In thick woods they cannot move at all.

"The establishment of a bridge over a ditch up to twelve feet in breadth occupies four moves; the throwing of a raft or trestle bridge, material being ready, requires fifteen moves for each forty-five yards of bridge, if not ready, five to ten moves more; and for a pontoon bridge ten to fifteen moves for each forty-five yards of length. If the work is done under fire, four or six moves more must be added, and if the fire is heavy and cannot be silenced it is for the umpire to decide if the bridge can be thrown at all.

"The time for conveying an order or for fetching up a commander is two minutes or a 'move' for each 750 yards.

"To send a short order and get an answer by field telegraph also occupies a 'move.'"

By an intelligent use of the above instructions controlled by a good umpire, an operation can be made to approximate to what would actually occur in war. We have not as yet made any mention of how the element of *chance*, which after all affects every operation in the field more or less, is brought to bear in the "Kriegs Spiel."

To take an example, we may wish to attack, and we may have to debouch under an enemy's fire to do so—well the probable success of such an operation will depend on many contingencies, the ground may

be favourable or the reverse, we may be superior in numbers,* the attack may have been prepared by a powerful artillery fire, or it may be accompained by a flank attack unseen by the enemy. In the game, the umpire takes all the different points for and against into consideration, the ground, the numbers, the condition of the troops attempting it, &c., &c., and with the assistance of prepared tables, which accompany the Instructions, he decides what faces of the die if turned up in throwing are to indicate success in the operation, and on the other hand what faces are to indicate failure. There are also tables for calculating the the losses of troops under fire All losses of course have to be removed from the board, and must not be employed again.

Everything depends on having a good umpire who understands not only the leading of troops, but who can also appreciate all the little contingencies which tend to render the operation possible or the reverse. He has also to decide if a body of troops is beaten, or capable of resistance or of attack, and if not at present able, after the lapse of what time they can again be employed.

A good umpire will select ground which may be expected to give instructive situations, and he must be always ready to criticise the position of the engagement. His decision, it is needless to add, must be final.

The advantages of the " Kriegs Spiel" are, (1) that it teaches the habit of reading a map quickly and correctly. It helps to educate the " eye for ground," that most necessary gift for all leaders of troops ; (2) it compels the players to be quick in deciding the movements of the troops, and to be exact and precise in giving the necessary orders ; (3) it enables the players to gain an insight into the harmonious working of the three arms. It shows them that there can be only general principles not rules, laid down for the disposition of troops and that the disposition for the ever-varying circumstances of each case must be decided on its own merits ; (4) it exhibits the relation between time and space better than in any other way, except of course in the field. By showing the exact time it takes to move troops along a road between one point and another, it teaches the player that he must consider how best he can arrange his troops on the march, and also so *time the commencement of the change*, that they may develope into a body fit for attack in any direction at the shortest notice. It demonstrates how a defile such as a single bridge over a river, delays the march of troops, which otherwise might not be appreciated in timing their arrival on the scene of action.

The two points in which the " Kriegs Spiel" is at a disadvantage, are, (1) that the players see more of the ground than they would in reality, for instance, they can see what is going on on the other side of a

* In reckoning numerical circumstances one battalion is reckoned equal to four squadrons, or to half a battery, or to four skirmisher sections.

wood; and (2) the moral condition of the troops is not taken into account, and on this, as we know, the fate of battles mainly depends.

The latter disadvantage, the more important one, applies to field manœuvres also. Notwithstanding these disadvantages, the "Kriegs Spiel" is undoubtedly a very useful means for illustrating minor operations of war, marches, and preliminary movements before battles, and is, therefore, well adapted for instructing younger officers; but long and desultory operations in a battle should be avoided, as they tend to weary the interest of the players.

Much depends on the umpire, and the value of his opinions after the game is finished.

There remains to be alluded to, a form of "Kriegs Spiel" recently introduced, and one which has found great favour, especially among the artillery and engineers at Berlin, called "Festungs Kriegs Spiel" in contradistinction to the other form we have been describing, which is called the "Feld." (Field) or Taktik" (Tactics) "Kriegs Spiel."

The "Festung" (fortress) or "Belagerungs" (siege) Game has for its object the illustration of the defence and attack of a fortress.

Similar maps are used as for the other game; but in addition to the blocks representing troops, there are blocks to represent earthern batteries, obstacles, and all the other paraphernalia of sieges.

More players are required, and they are divided off to the attack and defence.

In this way the siege of a fortress, from the time the enemy's outposts come in sight of it to the time of breaking ground, the formation of the parallels, zigzags of approach, and batteries, can be exemplified.

It will be easily seen how practical this game may be made. For instance, at a certain time it becomes necessary for the player charged with part of the attack on a fortress to throw up a battery. He intimates his intention to do so to the umpire, to whom he must give a written description of the work, with dimensions of the parts, &c., its armament, the working party, its reliefs, the tools, and so on. He must consider the means of transport to bring up this material; if by rail, he must specify the tonnage, &c., in fact, just as he would have to do in a real siege.

The following significant fact speaks for itself as to the value of this game. A little more than two years ago, the officers at one of the military schools at Berlin studied the attack and defence of the fortress of Metz, of which fortress and its environs they possessed very excellent and detailed maps on a large scale. Within a year, many of those officers formed part of the force which actully invested that fortress, and from their previous study of the ground, they found themselves well acquainted with every hill and road in its vicinity. No better illustration can be given than this of *their practising in peace what they may have to do in war*, and its manifest advantages.

Some enthusiasts in the "Kriegs Speil" in Prussia, have gone so far as to say that it may take the place of the Autumn Manœuvres, that both are not necessary. A little reflection however will show that this cannot be so. The Autumn Manœuvres give practice to officers and men in the appropriation and utilisation of ground, and in accustoming the eye to measurements; they also give practice to general officers and their staff in the giving and execution of orders; and again to all ranks in the carrying out of evolutions, in rapidly changing from the order of march to the order of battle, and the like; and last, not least, they test the supply and transport Departments.

In the "Kriegs Spiel" we are not tied down in our operations to the actual troops in garrison, nor have we to adopt false movements from consideration for the crops; and again we can represent many varying circumstances of the fight on the same ground.

Each is an useful complement of, but can never be a substitute for the other.

Our readers in India will observe that the first requisite for playing this game is to have good maps, on a scale of not less than six inches to the mile. We fear this condition will prove an obstacle to its introduction into this country, since, with the exception probably of the Map of Delhi and its environs, prepared by the Quarter Master General's Department, for the recent manœuvres, and a few plans of cantonments, &c., not a square mile of ground in India, has yet been surveyed on this scale. Our largest General Map of India, the "Indian Atlas," is only on a scale of 4 miles to an inch, and though the Revenue Survey has all the details of the Village Surveys on a scale of four inches to the mile they have never been printed, nor indeed, from the projection adopted, could they be brought together accurately so as to form a large map. We must look to the Quarter Master General's Department to assist us, and we trust this new demand will lead to the production of what has long been a great desideratum, good maps of each Military division and district with special reference to Military Strategy. If General Officers take but sufficient interest in the question, the means will soon be forthcoming; the Assistant Quarter Master General should prepare a skeleton projection on a scale of one inch to a mile, and put in the topographical features by enlargement from the Survey Maps. This scale is the same as the Ordnance Survey Map of England, and we doubt, if many officers at Aldershot last year possessed anything larger, it would answer well enough for the preliminary moves of the game before the hostile parties come in contact, but positions of every kind must be drawn on the full scale of six or eight inches. Here would be ample opportunity for our young Cavalry Officers to exhibit their skill in reconnaissance, and we hope it will be turned to account in filling in these maps, but it is equally a duty of the Infantry Officer, and we trust he will not be left behind in the work. We must not expect much at first in the way of "scales of shade," or place the standard of drawing too high, but we should insist on a certain minimum ratio of error

only." We might take as a type of these sketches of position, the one by General Bainbrigge, given in the Aide Memoire in the article "Field Sketching," though we have often felt that if His Grace *The* Duke really fought the Battle of Salamanca on its authority, his confidence bordered on temerity. However, let us make a beginning and do something to relieve ourselves of the reproach the French Army have incurred in the late war, of knowing less about their own country than their enemies. It may be a melancholy satisfaction that the Prussians have not *yet* surveyed India, though, if all that is said is true, the Topographical department at Berlin must have as large a capacity as the credulity of some of their admirers.

II.

The Study of Natural History.

A lecture under this title delivered at the Royal Artillery Institution, Woolwich, by the Rev. Canon Kingsley, has just been published. containing some admirable remarks on the relation between the soldier and the naturalist, from which we cannot forbear making the following extracts.

After some introductory matter, he proceeded :—

" It seemed to me therefore, that I might, without impertinence, ask you to consider a branch of knowledge which is becoming yearly more and more important in the eyes of well-educated civilians—of which, therefore, the soldier ought at least to know something, in order to put him on a par with the general intelligence of the nation.

" Let me, however, reassure those who may suppose, from the title of my lecture, that I am only going to recommend them to collect weeds and butterflies, ' rats and mice, and such small deer.' Far from it. The honourable title of Natural History has, and unwisely, been restricted too much of late years to the mere study of plants and animals; but I desire to restore the words to their original and proper meaning—the History of Nature ; that is, of all that is born, and grows—in short, of all natural objects.

" If any one shall say, by that definition you make not only geology and chemistry branches of natural history, but meteorology and astronomy likewise—I cannot deny it ; they deal, each of them, with realms of Nature. Geology is, literally, the natural history of soils and lands ; chemistry the natural history of compounds, organic and inorganic ; meteorology the natural history of climates; astronomy the natural history of planetary and solar bodies. And more, you cannot now study deeply any branch of what is popularly called Natural History—that is, plants and animals—without finding it necessary to learn something, and more and more as you go deeper, of those very sciences. As the marvellous interdependence of all natural objects and forces unfolds itself more and more, so the once separate sciences, which treated of different classes of natural objects, are forced to interpenetrate, as it were, and supplement themselves by knowledge borrowed from each other. Thus—to give a single instance—no man can now be a first-rate botanist unless he be also no mean meteorologist, no mean geologist, and—as Mr. Darwin has shown in his extraordinary discoveries about the fertilisation of plants by insects—no mean entomologist likewise.

" It is difficult, therefore, and indeed somewhat unwise and unfair, to put any limit to the term Natural History, save that it shall deal only with

nature and with matter, and shall not pretend—as some would have it to do just now—to go out of its own sphere to meddle with moral and spiritual matters. But, for practical purposes we may define the natural history of any given spot as the history of the causes which have made it what it is, and filled it with the natural objects which it holds. And if any one would know how to study the natural history of a place, and how to write it, let him read—and if he has read its delightful pages in youth, read once again—that hitherto unrivalled little monograph, White's 'History of Selborne;' and let him then try, by the light of improved science, to do for any district where he may be stationed what White did for Selborne nearly 100 years ago. Let him study its plants, its animals, its soils and rocks, and last, but not least, its scenery, as the total outcome of what the soils, and plants, and animals have made it. I say, have made it. How far the nature of the soils and the rocks will affect the scenery of a district may be well learnt from a very clever and interesting little book of Prof. Geikie's on 'The Scenery of Scotland, as affected by its Geological Structure.' How far the plants and trees affect not merely the general beauty, the richness or barrenness of a country, but also its very shape; the rate at which hills are destroyed and washed into the low land; the rate at which the seaboard is being removed by the action of waves—all these are branches of study which is becoming more and more important.

"And even in the study of animals and their effects on the vegetation, questions of really deep interest will arise. You will find that certain plants and trees cannot thrive in a district, while others can, because the former are browsed down by cattle, or their seeds eaten by birds, and the latter are not; that certain seeds are carried in the coats of animals, or wafted abroad by winds—others are not; certain trees destroyed wholesale by insects, while others are not; that in a hundred ways the animal and vegetable life of a district act and react upon each other, and that the climate, the average temperature, the maximum and minimum temperatures, the rainfall, act on them, and in the case of the vegetation, are reacted on again by them. The diminution of rainfall by the destruction of forests, its increase by re-planting them, and the effect of both on the healthiness or unhealthiness of a place—as in the case of the Mauritius, where a once healthy island has become pestilential, seemingly from the clearing away of the vegetation on the banks of streams—all this, though to study it deeply requires a fair knowledge of meteorology, and even a science or two more, is surely well worth the attention of any educated man who is put in charge of the health and lives of human beings.

"You will surely agree with me that the habit of mind required for such a study as this, is the very same as is required for successful military study. In fact, I should say that the same intellect which would develope into a great military man, would develope also into a great naturalist. I say, intellect. The military man would require —what the naturalist would not—over and above his intellect, a special force of will, in

order to translate his theories into fact, and make his campaigns in the field and not merely on paper. But I am speaking only of the habit of mind required for study; of that inductive habit of mind which works, steadily and by rule, from the known to the unknown—that habit of mind of which it has been said:—'The habit of seeing; the habit of knowing what we see; the habit of discerning differences and likenesses; the habit of classifying accordingly; the habit of searching for hypotheses which shall connect and explain those classified facts; the habit of verifying these hypotheses by applying them to fresh facts; the habit of throwing them away bravely if they will not fit; the habit of general patience, diligence, accuracy, reverence for facts for their own sake, and love of truth for its own sake; in one word, the habit of reverent and implicit obedience to the laws of Nature, whatever they may be—these are not merely intellectual, but also moral habits, which will stand men in practical good stead in every affair of life, and in every question, even the most awful, which may come before us as rational and social beings.' And specially valuable are they, surely, to the military man, the very essence of whose study, to be successful, lies first in continuous and accurate observation, and then in calm and judicious arrangement.

"Therefore it is that I hold, and hold strongly, that the study of physical science, far from interfering with an officer's studies, much less unfitting for them, must assist him in them, by keeping his mind always in the very attitude and the very temper which they require.

"I should like to see the study of physical science an integral part of the curriculum of every military school. I would train the mind of the lad who was to become hereafter an officer in the army—and in the navy likewise—by accustoming him to careful observation of, and sound thought about, the face of nature—of the commonest objects under his feet, just as much as of the stars above his head; provided always that he learnt, not at second-hand from books, but where alone he can really learn either war or nature—in the field, by actual observation, actual experiment. A laboratory for chemical experiments is a good thing, it is true, as far it goes; but I should prefer to the laboratory a naturalist's field club, such as are prospering now at several of the best public schools, certain that the boys would get more of sound inductive habits of mind, as well as more health, manliness, and cheerfulness, amid scenes to remember which will be a joy for ever, than they ever can by bending over retorts and crucibles, amid smells even to remember which is a pain for ever.

"But I would, whether a field club existed or not, require of every young man entering the army or navy—indeed, of every young man entering any liberal profession whatsoever—a fair knowledge, such as would enable him to pass an examination, in what the Germans call *Erd-kunde* (earth-lore)—in that knowledge of the face of the earth and of its products for which we English have as yet cared so little that we

have actually no English name for it, save the clumsy and questionable one of physical geography, and, I am sorry to say, hardly any readable school books about it, save Keith Johnston's 'Physical Atlas'—an acquaintance with which last I should certainly require of young men.

"It does seem most strange—or rather will seem most strange 100 years hence—that we, the nation of colonies, the nation of sailors, the nation of foreign commerce, the nation of foreign military stations, the nation of travellers for travelling sake, the nation of which one man here and another there (as Schleiden sets forth in his book, 'The Plant,' in a charming ideal conversation at the Travellers' Club) has seen and enjoyed more of the wonders and beauties of this planet than the men of any nation, not even excepting the Germans—that this nation, I say, should as yet have done nothing, or all but nothing, to teach in her schools a knowledge of that planet, of which she needs to know more, and can if she will know more, than any other nation upon it.

"Thus much I can say just now—and there is much more to be said—on the practical uses of natural history. But let me remind you, on the other side, if natural history will help you, you in return can help her; and would, I doubt not, help her, and help scientific men at home, if once you look fairly and steadily at the immense importance of natural history—of the knowledge of the 'face of the earth.' I believe that all will one day feel, more or less, that to know the earth *on* which we live, and the laws of it *by* which we live, is a sacred duty to ourselves, to our children after us, and to all whom we may have to command and to influence; ay, and a duty to God likewise. For is it not an act of common reverence and faith towards Him, if He has put us into a beautiful and wonderful place, and given us faculties by which we can see, and enjoy, and use that place—is it not a duty of reverence and faith towards Him to use those faculties, and to learn the lessons which He has laid open for us? If you feel that, as I say you all will some day feel, you will surely feel likewise that it will be a good deed—I do not say a necessary duty, but still a good deed and praiseworthy—to help physical science forward, and add your contributions, however small, to our general knowledge of the earth. And how much may be done for science by British officers, especially on foreign stations, I need not point out. I know that much has been done, chivalrously and well, by officers, and that men of science own them, and give them hearty thanks for their labours; but I should like, I confess, to see more done still. I should like to see every foreign station, what one or two highly-educated officers might easily make it—an advanced post of physical science, in regular communication with our scientific societies at home, sending to them accurate and methodic details of the natural history of each district—details $\frac{99}{100}$ of which might seem worthless in the eyes of the public, but which would all be precious in the eyes of scientific men, who know that no fact is really unimportant, and more, that while plodding patiently through seemingly unimportant facts, you may stumble on one of infinite importance, both scientific and practical.

"There are those, lastly, who have neither time nor taste for the technicalities, the nice distinctions, of formal natural history; who enjoy Nature, but as artists or as sportsmen, and not as men of science. Let them follow their bent freely; but let them not suppose that in following it they can do nothing towards enlarging our knowledge of Nature, especially when on foreign stations. So far from it, drawings ought always to be valuable, whether of plants, animals, or scenery, provided only they are accurate; and the more spirited and full of genius they are, the more accurate they are certain to be; for Nature being alive, a lifeless copy of her is necessarily an untrue copy. Most thankful to any officer for a mere sight of sketches will be the closet botanist, who, to his own sorrow, knows three-fourths of his plants only from dried specimens; or the closet zoologist, who knows his animals from skins and bones. And if any one answers, 'But I cannot draw,' I rejoin, you can at least photograph. If a young officer, going out to foreign parts, and knowing nothing at all about physical science, did me the honour to ask me what he could do for science I should tell him, learn to photograph; take photographs of every strange bit of rock formation which strikes your fancy, and of every widely extended view which may give a notion of the general lie of the country. Append, if you can, a note or two, saying whether a plain is rich or barren; whether the rock is sandstone, limestone, granitic, metamorphic, or volcanic lava; and if there be more rocks than one, which of them lies on the other; and send them to be exhibited at a meeting of the Geological Society. I doubt not that the learned gentlemen there will find in your photographs a valuable hint or two, for which they will be much obliged. I learnt, for instance, what seemed to me most valuable geological lessons from mere glances at drawings—I believe from photographs—of the Abyssinian ranges about Magdala.

"Or again, let a man, if he knows nothing of botany, not trouble himself with collecting and drying specimens; let him simply photograph every strange tree or new plant he sees, to give a general notion of its species, its look; let him append, where he can, a photograph of its leafage, flower, fruit and send them to Dr. Hooker, or any distinguished botanist, and he will find that, though he may know nothing of botany, he will have pretty certainly increased the knowledge of those who do know.

"The sportsman, again—I mean the sportsman of that type which seems peculiar to these islands, who loves toil and danger for their own sakes; he surely is a naturalist, *ipso facto*, though he knows it not. He has those very habits of keen observation on which all sound knowledge of nature is based; and he, if he will—as he may do without interfering with his sport—can study the habits of the animals among whom he spends wholesome and exciting days. . . .

"The two classes which will have an increasing, it may be a preponderating, influence on the fate of the human race for some time, will

be the pupils of Aristotle and those of Alexander—the men of science and the soldiers. They, and they alone will be left to rule; because they alone, each in his own sphere, have learnt to obey. It is therefore most needful for the welfare of society that they should pull with, and not against, each other; that they should understand each other, respect each other, take counsel with each other, supplement each other's defects, bring out each other's higher tendencies, counteract each other's lower ones. The scientific man has something to learn of you gentlemen, which I doubt not that he will learn in good time. You, again, have (as I have been hinting to you to-night) something to learn of him, which you, I doubt not will learn in good time likewise. Repeat, each of you according to his powers, the old friendship between Aristotle and Alexander; and so, from the sympathy and co-operation of you two, a class of thinkers and actors may yet arise which can save this nation, and the other civilized nations of the world, from that of which I had rather not speak, and wish that I did not think, too often and two earnestly.

"I may be a dreamer; and I may consider in my turn, as wilder dreamers than myself, certain persons who fancy that their only business in life is to make money, the scientific man's only business to show them how to make money, and the soldier's only business to guard their money for them. Be that as it may, the finest type of civilized man which we are likely to see for some generations to come, will be produced by a combination of the truly military with the truly scientific man. I say, I may be a dreamer; but you at least as well as my scientific friends, will bear with me; for my dream is to your honour."

"Nature," Mar. 21st.

III.

The Wellington Despatches.*

THIS volume of the Wellington Papers refers to the events of the Peninsular War from 1811 to 1814, and has been rightly designated an Appendix. It contains little worthy of note from the pen of the Great Duke himself during the memorable period it comprises, the Editors of the Gurwood series and of the Supplementary Despatches having almost exhausted these documents; but it abounds in papers of a different kind, which should be included in every collection of the authentic records of Wellington's exploits. The peculiar characteristic of this volume is that it includes a mass of the correspondence of Napoleon, Joseph, and the French Marshals in Spain, from Fuentes d'Onoro to Toulouse, which enables us, so to speak, to see the contest from our adversary's side, and which deserves to be carefully studied by any one who would really understand the authentic military history of the time. These documents, which, with no disparagement to a brave nation, we may fairly say are marked by a singularly French style, and of which many hitherto have been unpublished, not only bring out in striking relief the extraordinary ability displayed by Wellington during the arduous struggle which at last carried him in triumph from the Tagus to the Garonne, but also throw a vivid light on the real causes which weakened and destroyed the power of Napoleon in the Peninsula, and which exposed his formidable armies to defeat by a force almost to the last decidedly inferior in numeral strength. They show with what secrecy and rapidity the Duke matured his preparations for the brilliant campaign of 1812, when as yet he confronted, almost unaided, the gigantic hosts of the French Empire, and with what energy he pressed on to victory, when the retreat from Moscow and the uprising of Germany had shaken to its base that imposing fabric; and they prove clearly how ruinous was Napoleon's system of making war on a theatre naturally unfitted for it; how fatal were the results of his orders directed in ignorance of facts from a distance; how the dissensions and jealousies of his lieutenants more than once led to ignominious failures; and how genius of the very highest order was baffled and thwarted when it endeavoured to contend against the nature of things, and when it trusted to unsuitable instruments. This volume also contains papers not without interest on the great events which precipitated the fall of Napoleon, and on the negotiations of 1814; and several letters of Soult in it bear the highest testimony to the military skill and loyalty of that able commander. A few, too, of Wellington's despatches are characteristic and deserve notice, though, as we have said, they do not form the most important part of the present collection.

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* *The Wellington Despatches.* Supplementary Despatches, Correspondence, and Memoranda of Field-Marshal Arthur, Duke of Wellington, K.G. Edited by his son, the Duke of Wellington, K.G. Vol. 14. Appendix. 1812-1814. London, 1872.

This volume opens at the beginning of the momentous era 1812. At that time, though the invasion of Portugal by Masséna had completely failed, five-sixths of the Peninsula, at least, was held in the iron grasp of Napoleon, and it seemed scarcely possible that the feeble force which had baffled his eagles at Torres Vedras could much longer resist his efforts. The east of Spain had been subdued by Suchet, Joseph seemed for the time secure on the throne; Soult and Victor, established in Andalusia, were advancing to Cadiz and Tarifa, and Marmont, in command of Masséna's army, and with powerful reserves at hand, held Leon with the northern provinces and the great line of communications to France. These enormous armies, which numbered at least 350,000 excellent soldiers, were confronted only by Wellington's force, not more, certainly, than 60,000 strong, and by the Spanish guerillas and levies, and this being so we cannot wonder that Europe believed the contest hopeless. Yet, though we do not affect to doubt that had Napoleon made proper use of his prodigious military resources, he could have compelled the Duke to re-embark, there were circumstances in the conditions of the struggle which made it not so utterly unequal as it appeared even to experienced eyes; and it is because Wellington perceived these, and never swerved from his hopeful convictions, that his capacity and wisdom were so pre-eminent. His position in Portugal was extremely strong; he had the immense advantage of the command of the sea, his army, concentrated and well supplied, was directed solely by his orders, and was powerfully aided by the insurrection which consumed the invaders wherever they spread; and all this gave great general opportunities occasionally to strike boldly and even to gain important success. The French armies, on the other hand, were dangerously exposed along the whole line of their communications from Bayonne to the south, which absorbed a considerable part of their force; they were unduly broken up through the orders of a master who underrated their foe; they were under generals with separate commands, and who were often jealous of each other; they were guided in their main operations by the Emperor's directions given from Paris; they were not seldom so ill-provided that their movements were stopped or paralyzed; in a difficult and intricate country they were assailed by the efforts of a whole nation, which wasted them and gave them no repose; and the result was they were not able to put forth their real military strength; their numbers were usually of no avail; and they were frequently liable to defeat by a daring, skilful, and wary adversary. The consequences of this state of things were seen from the first in 1812, even before Napoleon had despatched a man from the Peninsula to the Russian frontier. Wellington, who had secretly prepared his siege train, and had brought it by water carriage from Lisbon, broke up suddenly from his cantonments and took the great fortress of Ciudad Rodrigo—the avenue to the heart of Spain—almost under the eyes of Marmont, whose army, weakened by large detachments and widely scattered in order to subsist, was not able to arrest the victor. How little the Marshal expected this affront, and how surprised he was at the issue, we see from the following curious letters. He wrote thus to Napoleon on the 16th of January:—

"I am marching as quickly as I can to the relief of Ciudad Rodrigo. The four divisions I had concentrated were not sufficient, so I have been obliged to call up two divisions of the Army of the North and the division of General Bonet from the Asturias. I shall thus have 60,000 men, with whom I shall attack the enemy. You may expect soon to hear that the French army has done some glorious exploit."

The fortress had fallen on the 19th, long before Marmont had reached Wellington. The Marshal wrote ruefully on the 24th :—

"On the 19th, Ciudad Rodrigo was captured by assault. In all this there is something so incomprehensible that I do not think it right as yet to hazard a remark."

No sooner had Ciudad Rodrigo fallen than Wellington began to direct his efforts against Badajoz, the second fortress which covered the approaches of the Spanish frontier. The operations which ensued deserve the attention of the Military student, for they illustrate the ability of the Duke, and prove how disastrous were the effects of Napoleon's orders despatched from Paris, and how his peculiar strategic system failed in a theatre like the Peninsula. As Wellington, skilfully availing himself of the advantage of his central position, was preparing to march into Alemtejo, Marmont, stationed on an exterior line in Leon, entreated Napoleon to allow him to make a corresponding movement to the south, and to co-operate with a part of the army of Soult from Andalusia to protect Badajoz. This enterprise, though not without danger, for it would expose the line of the French communications, which Napoleon knew was his weak point, would in all probability have saved the fortress; and, had Marmont and Soult united they might possibly have found the opportunity which they had let slip the preceding year, to strike an effective blow at the British commander. But Napoleon, ignorant of the means which Wellington had by this time in his hands, convinced that he would not venture to move into Estremadura, far from his base, and unaware of the impediments which almost doomed to immobility the French armies, had devised a scheme which, in his judgment, would alike keep Marmont in his true place, covering the communications of the French with Bayonne, and would secure Badajoz from serious peril. If Wellington, he said, invaded Estremadura, Marmont was to enter the north of Portugal, and this expedition, which would menace Lisbon and the communications of the English with the sea, would retain Marmont in his proper sphere and compel Wellington to a speedy retreat. His reiterated instructions were precise :—

"Place your army so that in four marches it can concentrate at Salamanca. . . . Maintain an irregular warfare with the enemy's outposts. You will thus command all the operations of the English. If Lord Wellington marches on Badajoz allow him to go there; collect your army and move on Almeida; push forward light parties on Coimbra, and rest assured that Lord Wellington will soon return. The English are too knowing to make such mistakes. , . . Do not think of going southward, but march straight into Portugal if Lord Wellington foolishly ventures to the left bank of the Tagus."

Like all Napoleon's strategic combinations, this plan was founded on sound theory: but as it rested on a misconception of the facts, it was destined to end in calamitous failure. In the first place, the Duke was much stronger than the French Emperor chose to believe, and could afford to disregard a mere demonstration against the north of Portugal; and, in the next place, what was more important, the army of Marmont was not able to march into Beira in any real force, the country being utterly exhausted, and magazines not being forthcoming. We see here one of the chief reasons of the discomfiture of Napoleon in Spain; his system of rapid and daring movements, without previously collecting supplies, was baffled when the territories he intended to invade were not capable of supporting his troops. Marmont, upon the spot, remonstrated in vain; and though it would be idle to compare his military talents with those of his master, he certainly recommended the more judicious course, so great is the difference between schemes based on speculation and on knowledge of the facts. Marmont's letters are interesting and significant:—

"Your Highness (Berthier) writes that if my army were concentrated at Salamanca, the English would not be so foolish as to move into Estremadura, leaving me in their rear, and with the power of going to Lisbon. . . . . The Emperor, it would seem, reckons without considering our means of subsistence; this is an insuperable difficulty; if magazines had been provided the Emperor's orders might be feasible, but they are not so now. In the existing state of our affairs my army could not pass the Coa in force, and Wellington's detachments are quite strong enough to baffle any attack I could make on Portugal. No movement in that direction could save Badajoz. . . We are not on equal terms in our present war with the English. The English army is always ready for action, for it is well provided and has abundant means of transport. We have no magazines that will give us food for five days, and no means of transport whatever."

The result is sufficiently known to students of the Peninsular war. The Duke did not allow himself to be terrified by the petty demonstrations which Marmont, compelled to obey Napoleon, made against his communications in Portugal; and having rapidly collected his army, he pounced upon and captured Badajoz before Soult could relieve the fortress. A French general officer observed:—

"Every calculation turned out false. The army of Marmont moved away from ours when it ought to have been moving towards it. Wellington, with the combined English and Portuguese forces, has taken the fortress under the eyes of two French armies, 80,000 strong."

These splendid achievements threw open the Spanish frontier to the British Commander, and prepared the way for greater success. The result was due to the striking ability with which Wellington made use of his small force in a central position, and to the difficulties and misdirection of the French armies; and it should be remembered that Ciudad Rodrigo and Badajoz fell before Napoleon had weakened his forces in the Peninsula. The French Emperor, of course, denounced his Mar-

shals as incapable and timid ; but he really had only himself to blame for making dispositions in ignorance of the facts ; and, in truth, when viewed in the light of the events his schemes, great commander as he was, seem almost as idle as the designs of the pedants of the old Aulic Council, which he was wont to turn into ridicule. Such will ever be strategy resting on hypothesis and deficient knowledge ; but this Napoleon would not admit, and he wrote indignantly as he was setting off to Russia :—

" The Emperor orders you to take means to prevent 40,000 English soldiers from ruining his affairs in Spain, which will certainly take place if the commanders of his armies are not animated by zeal and patriotism. On his return from Poland His Majesty will go to Spain in person."

We shall not dwell on the brilliant events of the Spanish campaign of 1812. Our readers know how, when the French armies had been diminished by draughts for Russia, the Duke boldly invaded Spain ; how Marmont opposed him on the Douro ; how the Marshal recklessly moved against him without waiting for the reinforcements which ought to have assured success, and how after a long game of manœuvres, Marmont was suddenly and brilliantly overthrown in the battle which, in a special manner, proves Wellington's talents as a tactician. We shall not comment on Salamanca—the Austerlitz of the Peninsular War—but we quote a few lines from a report by Marmont, characteristic of the Napoleonic bulletins—

" The troops performed prodigies of valour, but were compelled to retreat. . . . Our loss is estimated at about 5,000 men. That of the English is much greater—the ravages done by our artillery were incalculable."

The defeat of Salamanca, due mainly to the vanity and ambition of Marmont, disturbed the whole conquests of the French in Spain, and struck a fatal blow at their ill-gotten power. Joseph was compelled to evacuate Madrid ; Andalusia and the south were finally lost ; and though possibly had the bold advice of Soult been followed the war even yet might have taken a different turn, and though Wellington was obliged to retreat not without disaster at the close of the year, the Peninsula was thenceforward to be no longer the scene of French triumphs. Suchet, indeed, still firmly held the east ; but everywhere else the French occupation was restricted within diminishing limits, and the French armies, surrounded by national insurrection on every side, and often wretchedly equipped and supplied, was shorn of much of their military strength. Dissensions were the natural result, and the volume abounds in curious recriminations between Joseph ,who accused Soult of cowardice during the retreat from Burgos and of openly aspiring to the Crown of Spain, and Soult who, very justly we think, charged Joseph and his colleagues with incapacity. As might have been expected, the complainants referred their disputes to their Imperial master, though thousands of miles away in Russia, a striking proof of the abject submission to one dominant will which was the chief feature of Napoleon's purely autocratic govern-

ment. The Emperor's remarks to one of Joseph's aide-de-camps at Moscow are very characteristic of the man :—

"The King and Marshal Soult had made a mistake, but he could not trouble himself about those wretched squabbles when he was at the head of 500,000 men, and was undertaking gigantic operations." . . . He added that the Duke of Dalmatia had the only military head in Spain.

Before long the instrument of Napoleon's power, the Grand Army with its allied contingents, had perished in the awful catastrophe. The writer from whom we have just quoted saw a great deal of the celebrated retreat; and it will be observed that he ascribed the ruin of the French army to the true cause—the want of food and supplies in a country unable to support such a host, a striking instance of the capital vice in Napoleon's system of war of invasion. He says :—

"The army when I left was in a frightful condition. For a long time its disorganisation and losses had been terrible; the artillery and cavalry had ceased to exist. All the regiments were confused masses; the soldiers marched pellmell, thinking only how to procure food, every day thousands of men fell into the hands of the Cossacks. Vast as was the number of the prisoners, that of the dead was still greater. It is impossible to describe how horrible were the results for the want of food, for more than a month no rations had been served out, dead horses were the only resource, and the Marshals were often without bread."

The year 1813 saw the beginning of the fall of Napoleon. While in Saxony he fiercely struggled against the hosts of the Coalition, and held the balance of Fortune in suspense by his genius and the terror of his name, his power in Spain though still formidable, collapsed quickly, and was reduced to nothingness. The Duke, at last, at the head of a force not wholly unequal to his foes, set forth from his lair in the north of Portugal, and advancing rapidly, drove before him the French armies, which vainly endeavoured to guard their communications with Bayonne, and were being surely outflanked by their enemy. Then was fully seen the extraordinary advantage to a great General of the command of the sea in the actual circumstances of the Peninsula. Wellington, transferring his base to the north of Spain, from the rocks of Lisbon, compelled his adversaries precipitately to retreat, and to fight in a disastrous position. It is unnecessary to comment on the great day of Vittoria, or on the expulsion of the invaders from Spain; but it should be remarked that had Suchet, who was still unmolested in the east, co-operated in good faith with Joseph, the retreat of the French might have been secured, or even turned to their advantage, for their combined armies were still largely superior in numbers to their opponents. But Suchet, whether from distrust or jealousy, or in obedience to Napoleon's orders, refused to fall back upon the Ebro to the aid of his hard-pressed colleagues, and Joseph was literally hurled out of Spain, though nominally at the head of forces more powerful than those commanded by Wellington. We quote from one of Joseph's imploring letters to Suchet :—

"The enemy is about to cross the Carrion in greatly superior force.

I hope to be rejoined in the plains of Burgos by the infantry of the Army of Portugal, to attack the enemy and drive him across the Douro. I trust you have received instructions suitable to our actual situation. So far as I can give an opinion, I think you should so conduct yourself as not to remain isolated in the Peninsula."

The volume contains many interesting details about the long and well-sustained contest between Soult and the Duke on the French frontier, and the operations which at last brought the British army in triumph to the Garonne. The story, however, is well known, and we need not repeat how the Duke of Dalmatia in vain attempted to roll back the tide of invasion behind the Pyrenees; how, when baffled, he made a gallant stand, but was gradually driven from the formidable positions to which he retreated time after time; how he appealed fruitlessly to the honour of Suchet to assist him in the unequal encounter, but was left isolated by his brother Marshal; how the Nive, the Nivelle, the Adour, and Orthes were illustrated by British exploits and triumphs; and how at last the Duke, having fought his way in a course of unchecked victory to Toulouse, closed the war at the head of the noble host which had become in his master hand the most perfect of military instruments. The most striking features in the contest, perhaps, were that Soult and Suchet, if they had combined, would have been still superior in force to Wellington, but could never be brought to act in concert; that the diversion made by the Duke in France contributed at least as much to the issue as all the efforts of the Coalition repeatedly overthrown by Napoleon; and that one of the causes of our success in France was the admirable discipline maintained in our army, in contrast with the excesses and rapacity of the French, which exasperated even their own countrymen. Imperialism, indeed, in the hour of trial though still illustrated by the most brilliant genius, showed badly and collapsed rapidly; and between the dissensions of his lieutenants and political errors committed by himself, the miserable condition of his ill-supplied armies, and the apathy and despair of France, Napoleon's fall was not long delayed. Soult gives the following painful description of the brave army under his command:—

"It is with regret I have to report to your Excellency that the number of deserters to the enemy is greatly on the increase. The offers made by the English, and the privations and hardships suffered by my troops, are the causes of this neglect of their duty. All the administrative services of the army are in a bad state, and the complete want of money causes many complaints."

Soult's conduct at this terrible conjuncture was creditable to him in the highest degree; he was one of the few of Napoleon's lieutenants who remained faithful to their master to the last. Nor were his military talents less conspicuous; he not only played a long losing game against Wellington with consummate skill, but devised a scheme of defensive operations for the whole of France which, if less brilliant than Napoleon's daring and grand conceptions, was more prudent and according to rule. It must not be forgotten that if the strategy of Napoleon

in 1814 was wonderful, it risked everything for the entire Empire, and, considered as a whole, it was too ambitious and over bold to have had a good chance of success. Soult's scheme was to collect the remains of the French armies to defend Paris, leaving merely detachments on the frontier; and it is difficult to predict what the result might have been had Napoleon, aided by these reinforcements, won a decisive battle over Blucher and Schwarzenberg. The Marshal wrote thus to Clarke :—

"I wish you to propose to the Emperor to form as large an army as possible before Paris by drawing together all the disposable forces of the Empire, and to create as many partisans as we can to defend all other points which have been invaded or are threatened. . . . Shall France, fair France, perish after having ruled the world ?"

In striking contrast to Soult's fidelity was the perfidy of the frivolous Murat. We quote from a characteristic letter of Napoleon to him :—

"You are a good soldier on the field of battle, but everywhere else you have neither energy nor courage. You can hardly be of those who think that the lion is dead, and that you can insult him ? If these are your calculations you will find yourself mistaken."

This volume contains an interesting account of Soult's operations around Toulouse. It is clear the Marshal laid no claim to having won that bloody battle; he admitted that he was compelled to retreat after the heights of Mont Rave had been seized. He thus describes the failure of the flank attack of Taupin, which probably would have succeeded had not the British army acquired a decisive ascendency by repeated victories :—

"These dispositions promised the happiest results ; 7,000 or 8,000 English and Portuguese ought to have been destroyed or taken prisoners if the 4th Division had attacked as I had a right to expect; but its ardour died away, it swerved, halted, and gave the enemy time to form and assail it."

The following letter from Lord Bathurst shows the real purpose of the British plenipotentiaries even at Châtillon at the last moment. But for his obstinacy and extravagant pretentions, Napoleon might have retained the throne, and Waterloo and St. Helena have never been scenes in the eventiful drama of history :—

"There is so strong an impression at Châtillon of the indifference of the French to the House of Bourbon that I see no prospect of being able to break off the negotiation on that ground if Bonaparte be willing to subscribe to the project."

Review.

WE have to acknowledge, with thanks, the receipt of the Abstract of Proceedings of the Sanitary Commissioner with the Government of India, for the half year ending December 1871. These reports embrace so wide a range and minute a detail of subjects that the mere enumeration of them would absorb more space than we could well spare, but we regret that they are not more widely circulated as a proof of the amount of care, foresight, skill and science, expended on the sanitary administration of the Army in India. We should like to see these reports on the tables, both of the Officers' Library and the Soldiers' Reading-room, and we venture to say they would do more for their practical education than nine-tenths of the works now to be found there.

The Officer would see at a glance the condensed results of the interminable Committees which it has been his duty to attend in which his interest extended no farther than what was necessary to prevent his signing his name in the wrong place, while the soldier would learn that the "Departments" are not necessarily antagonistic to his regimental authorities, that even Barrack Masters and Executive Engineers and Assistant Quarter Masters General have sympathies for him, and that there is no question or suggestion regarding his health and comfort, however trifling, that is not made the subject of earnest discussion and enquiry. We might point to the correspondence on "Barracks at Jullundur" in proof of this, and we quote the following to point out to our own readers a wide field of usefulness.

"16. His Excellency the Commander-in-Chief has also remarked with reference to the alleged discomfort in the lower floors of the barracks that these rooms have been left entirely unfurnished, whereas, if a little furniture and a few accessories to comfort, maps, pictures, &c., were provided, they might be made very attractive places to which quiet men might resort escaping from the general barrack room without exposing themselves to the sun, or having to quit their barracks, a question which should be referred for the consideration of the Military Department." . . . . . .

"It has constantly been a subject of regret that soldiers should pass so much of their time in their beds, admitting that they require beds as a resource, and that under present circumstances, as their kits and boxes, in fact, all their possessions are there, their dormitory must also of necessity be a place of daily resort, yet it is desirable under the view of improving the soldier's general character and habits that he should have some place to go to in the day time, and not be compelled to be bedridden all day for want of such, without going out in the sun in the hot weather, which he must do to get to the General Library, Recreation Room or Workshops. These institutions are most valuable, but the library cannot contain more than a fraction of the regiment, and only a comparatively small number of the men are craftsmen capable of employing themselves at trades. There remains therefore the remainder of the men to be benefited by having the day room to resort to, where

something more of quiet may be obtained than in the common ward, where they might have readings or company lectures during the hot weather."

"The want of day rooms has often been lamented by regimental officers of liberal minds who really take an interest in the moral improvement of their men. A moderate allowance of furniture would suffice to make these rooms such as would attract the men, and when once established, it would be a matter of pride with many regiments to have them ornamented with a few pictures, &c., such as at present are generally found in all well regulated Sergeant's Messes. In one battery of artillery, which His Excellency distinguished among many in which the officers took pains to improve their men, the officers devoted themselves in turn to give their men instruction on military subjects, history, &c., without some such place belonging to the company or battery this could not be done."

We are glad to observe that the subject of a Cholera Map of India has been discussed in these reports, but there are other difficulties besides that of scale only. Such a map should not be a mere skeleton but a physical map, exhibiting the altitudes, the drainage basins, and the geology of the soil, for all these enter more or less into researches on the origin of cholera.

Gleanings.

THE number of " Engineering" for March 22nd has a description and diagram of a Wood-working Machine, constructed for the Royal Engineers by Messrs. Allen Ransome and Company, and expressly designed by them to perform all the operations of tenoning, morticing, boring, &c., required in converting timber into frames and cases for military mining. Separate machines for these purposes have been long known and appreciated in the building trade, but this is the first time they have been combined in a single machine, and it is an important step not only in mechanical progress, but in the development of a higher organization of the " Royal Engineers" as a corps, to which they have long been slowly advancing, and to which we trust they will now speedily attain ; since it would appear that steps are being taken to put them in the matter of tools and implements, on an equal footing with the other branches of the service. It is nearly four years since we saw at the Smithfield Cattle Show a small self-moving portable steam engine of the agricultural type stated to have been constructed by Messrs. Aveling and Porter for the Royal Engineers, and it is difficult to believe that although even then these portable engines were being produced and disposed of at an average rate of 10,00 per annum, the Royal Engineers, who of all engineers ought to be most familiar with machines for saving time and labour were still provided only with hand tools, and performed all the operations of sawing, planing, morticing, rivetting, punching, shearing, grinding, pumping, blowing, hoisting, &c., in precisely the same primitive modes that were used by the corps more than 100 years before steam was thought of as a motive power, in fact, by the simple sweat of their brows.

We ridicule the old Scotch woman who thought it impious to thwart the will of Divine Providence by raising wind with a new-fangled machine instead of waiting patiently for whatever dispensation of wind Providence might be pleased to send on the " sheeling hill," but practically we are following her example very closely, and if a British Army took the field to-morrow, we should still resort to the same old method of cutting up timber for the sleepers, balks and chesses of our battery and bridge platforms by pit-saws, the same primitive hand-bellows for ventilating our galleries and mines, and the same hand-pumps for our water supply and drainage.

It is true we made a slight advance in the Crimea, and more recently in Abyssinia by laying down a few miles of railway from the sea shore, inland ; but in the first case it was accomplished by a special civil corps—the army works ; and in the second it tried our organization so severely that we could not take it up again, and we left it there. No attempt as yet seems to have been made by the Royal Engineers to introduce any organized system of railway or road-making, for the former is only a modification of the other, and when the road is once made, the laying of rails on it is a very simple matter as was instanced on the Pacific Railway where, after the earth work had been completed the rail-

way was laid down on it at the rate of two and one-third miles per day. But the fact is the present organization of the Royal Engineers is not suited to any such purpose, all manual labor must be supplemented from the line. The highly trained sapper must be reserved for head-work and superintendence only. What can be more inconsistent than training a man to the use of the most delicate scientific instruments, to a high degree of skill in surveying, engraving, photography, &c., (to which many of these men attain) and then sending him to certain death at the head of a sap where the utmost result of his training is the excavation of a few cubic feet more earth than his unskilled comrade in the line can perform in similar time. There is nothing in the simple manual labour of siege or field works of pontooning or mining that might not just as well be performed by the infantry soldier especially, as a larger proportion of them come from the agricultural class, and probably have been accustomed to the use of the spade, the pick, and the bill-hook from boyhood.

The Royal Engineer private must be pushed forward to the "status" and training of the engine-driver, and to the charge of steam machinery for every military purpose to which it can be applied, with such other scientific duties, such as surveying and electric telegraphy as he performs at present; and the private soldier of the line must relieve him of all simple manual labour. Instead of ordinary pontooning the sapper must be taught to construct and repair or extemporize railway bridges, and to construct a lattice girder in iron as quickly as he now puts together a gun platform. To do this he must be supplied with portable steam tools and the engines for moving and working them, and for moving the greater weight of "materiel" he will then require to carry with him. In India we can go on for a little while longer with our pioneer corps and our elephants, but at Chatham these must be replaced with steam tools and traction engines.

Now is the time in peace to carry out this organization not to wait for another war, and then rush into it in a fit of panic, or purchase up a hundred untried inventions on the chance of one of them proving useful. Little experiment is required now, as we have almost all the tools and machinery in daily work by thousands round us, though they might be improved as in the case of the morticing machine under notice, by mounting them on wheels to render them portable by traction engines.

The traction engines should be of varied style and design, but all self-propelling, and capable of imparting motive power to other machines; some would be heavy with broad wheels for rolling, others should be provided with a drum or windlass, as in the steam-ploughs now so largely used, so as to be efficient for winding or hauling, or capable of hauling themselves up a steep incline by first sending out an anchor or grapnel attached to their steel wire ropes and then when they have reached a safe position reversing their motion and hauling up their loads after them. By this means a traction engine can get up almost any incline practicable for wheel carriages.

A troop of, say, six of these engines would cost from 12 to £15,000, and with their portable tools attached might take their place in line with the reserve of heavy artillery, and manœuvre with them at least as easily as our old 24-pounders were accustomed to do before the Crimean War, and the Royal Engineers might well be proud to pass in review with such a battery even though only in the second place of honour. The portable tools would be an additional expense, and must be selected with due regard to the physical geography, climate and other conditions of the scene of the intended campaign, but we should consider a portable deal and log sawing frame (Robinson's), punching and shearing, and drilling and rivetting machines, a mortar mill and a "Gwynne" pump or steam fire engine, with the wood-working machinery already noticed, indispensable.

Portable flour mills and ovens (Perkins'), which can be kept at work even on a march, for the Control Department, would probably be added, and a hydraulic Gyn or tubular iron sheers (in sections for portability) for lifting the heavy guns now employed in fortresses should accompany the troop. We have no good steam excavator as yet, but Jones' Coal-cutter worked by compressed air would be invaluable in military mining or even in the open sap. The whole science of war is daily altering and if it be true that at the recent siege of Strasburg, the approaches were eight feet deep, we may say that the sapper's occupation is gone for no amount of artillery fire can prevent the approach of a sap which exposes nothing to its aim, and which might be excavated by machinery to the very edge of the covert way by a few engineers without the loss of a man except by accidents of shells and sorties which could do little injury to it.

Let it not be supposed that in these remarks we are disparaging the present organisation of the corps of Royal Engineers, but we look naturally to them as the source of progress and improvements in these matters because we know that they must be adopted at home before we can hope for any extension of them in a minor degree to this country, yet while we recall with respect the names of Jones, Pasley, Douglas, Portlock, Reid, and Fowke, and of our own Presgrave, Cheape, Napier, Cunningham and Yule, we cannot but feel that our Engineers have still to attain that prestige in their own special art that they have won in every other branch of science. Our Peninsular and Indian experiences have partaken too much of the "de vive force" or "happy-go-lucky" system of Sir Thomas Morgan's School, and the siege of Sebastopol offered little more opportunity for scientific engineering than its great prototype of Troy.

The French have forfeited the Mural Crown won for them by Vauban, and retained down to the Siege of Antwerp in 1832, and the Prussians are ready to seize it, and already they are organising railway corps on a scale hitherto unthought of. Will our engineers contest it with them or will they tamely submit to be "seconded" into the peaceful pursuits of civil life.

Books wanted to purchase.

THE BRITISH INDIAN MILITARY REPOSITORY, edited by Captain S. Parlby, Bengal Artillery, Vol. V. and following Vols. or Nos. 8vo. 1826.

THE EAST INDIA MILITARY CALENDAR, 3 vols. 4to., published about 1823-25.

DODWELL & MILES "ARMY LIST," of the three Indian Armies, large 8vo., date unknown.

JAMES' MILITARY DICTIONARY, thick, 8vo., date unknown.

MULLER'S SCIENCE OF WAR, 3 vols. 8vo., 1811.

MEMOIRS OF GENERAL SIR R. GILLESPIE, 1 vol., 8vo.

MEMOIRS OF JOHN SHIPP, 3 vols., 8vo.

Particulars of Price, Condition, &c., to be sent to the SECRETARY United Service Institution of India, at Simla.