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CAVALRY IN ATTACK AND DEFENSE.*

BY CAPTAIN ARTHUR L. WAGNER, SIXTH INFANTRY,
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"No army can enter the lists with a fair chance of success, unless it has a cavalry that can both ride and fight."— *Wilson*.

THE characteristics of cavalry have already been generally considered; the tactical handling of this arm will now be more particularly discussed.

THE CHARGE IN LINE.

Formation.—The charge in line is made in close order, boot-to-boot, the forward movement increasing in rapidity until it finally terminates in a shock delivered at full speed. The effect of the shock depends upon the cohesion, weight, and speed of the charging force; in the *mêlée* which follows, the result depends upon the weapons of the trooper, and his skill in their use.

Whether victorious or unsuccessful, cavalry is invariably disordered by the shock and succeeding *mêlée*. In small bodies the disorder is of short duration, but in large masses it lasts a long time, the confusion of broken ranks being increased by wounded and

* From the advance sheets of "Organization and Tactics," by permission of the author.

riderless horses, as well as by troopers who have lost their weapons and become separated from their tactical units. If, then, cavalry were to charge in a single line, it might, while disordered by its own success, be easily overthrown by even a small body of hostile cavalry attacking in close formation and well in hand. To guard against a counter-charge, a support is, therefore, necessary; and this support must not be immediately in rear of the attacking line, lest in case of the defeat of the latter, it be thrown into confusion or ridden over by the retreating troopers, who almost invariably break straight to the rear. Moreover, the flanks being dangerously weak points in cavalry, the support must be so placed that it can readily attack the flank of the enemy, or protect that of its own attacking line. It should, therefore, be echeloned on the flank which is more exposed to the enemy's attack, or from which it can better operate against the flank of the hostile cavalry. Either to assail or defend a flank, the support is almost sure to be drawn into the *mêlée*, and a reserve must, consequently, be at hand to decide the victory, to ward off an attack upon the first line while disordered by the charge, to pursue the enemy, or cover the retreat. The reserve may be a considerable distance in rear of the attacking line, with wide intervals to admit of the retreat of the latter, but it is usually echeloned on the opposite flank from the support. When this flank is covered by other troops or by natural obstacles, the reserve should ordinarily be on the same flank as the support, and echeloned on the outer flank of the latter. In general terms, the support and reserve should be so disposed that the attacking line may be relieved from all anxiety in regard to its flanks, and devote its whole attention to the enemy in its front. In a cavalry combat, that force which can bring into action the last formed reserve is almost sure to be victorious. At Wagram, Grouchy drove back Rosenberg's cavalry with great slaughter; but Hohenlohe's cuirassiers fell upon the disordered French horse, and would have swept it from the field, had not Mottlau brought up a fresh cavalry force and defeated Hohenlohe in turn.

In a small force, the duties of support and reserve are combined in a single body, part of the support being kept unbroken and held well in hand when the rest is launched into the fight; but in general, an attacking force of cavalry consists of an *attacking line*, a *support*, and a *reserve*. The attacking line must be strong, for if it fails, the rest can generally do no more than present a complete reverse; but if too much of the force be placed in the attacking line, the lack of a proper support and reserve may cause it to be defeated while in

disorder. As a rule, the attacking line should consist of one-half of the strength of the entire force, the support varying from one-fourth to one-third, and the reserve accordingly from one-fourth to one-sixth. Troops and, if possible, squadrons should be preserved intact in each line; though one or more platoons of a flank troop may be echeloned on its outer flank, and in small bodies the reserve and support may both be taken from the same troop.

The distances between the lines, or echelons, vary with the size of the attacking force. In the case of a troop, the distance from the attacking line to the support is about eighty yards, and from the support to the reserve not more than 150 yards. In the case of a brigade or division, the former distance is about 275 yards, and the latter from 150 to 200 yards. If the flank of the attacking line be seriously threatened, the support may close to not less than 100 yards. The inner flank of the support should be from fifty to seventy-five yards beyond the outer flank of the attacking line. The inner flank of the reserve is generally at a similar distance beyond the other flank of the attacking line. If there be no reserve, a portion of the support may be placed, with wide intervals, in rear of the attacking line.

Even though the attack be made in line, small columns are the proper formation for maneuvering cavalry. They possess greater mobility and flexibility than the line, present a smaller target to artillery fire, and admit of the easy passage of obstacles and the utilization of sheltering features of the terrain. In moving forward to attack, the attacking line should be formed in line of columns of fours at full interval. The deployment into line must be made at the right moment; if delayed too long, the attacking body may be itself attacked before it is in proper formation; if it be made too soon, there is less chance of surprise and greater exposure to loss, and changes of direction in line, which always impair the cohesion of the attacking body and weaken the force of the shock, may become necessary. The support should also be in line of columns of fours at deploying intervals, and its movements should conform to those of the attacking line. The reserve is similarly formed. If, in issuing from a defile, forming on right or left into line, or changing front, time does not admit of completing the formation, each troop or squadron may be advanced to the attack as soon as it is formed.

In most armies, each part of the charging force is formed in two ranks. In our service the charge is made in single rank. There is a decided lack of unanimity in the views of the best authorities on this subject. The advocates of the single rank formation claim that

the rear rank generally merges into the front rank in the course of the charge, thus producing a charge in single rank; that where this merging does not take place, the rear rank is useless; and that casualties are increased, and the rear rank thrown into confusion, by the disabled men and horses in the front rank being run over. On the other hand, it is claimed that a line invariably loosens out in the charge, and that a charge boot-to-boot is impossible unless there are men in a rear rank to push forward into the vacant spaces created in the first.

Pace and Conduct of the Attack.—In moving to the attack, unless time is urgent, the walk is maintained until the zone of effective artillery fire is entered, when the trot is taken and continued until within from 1,200 to 800 yards of the enemy. The columns then deploy into line and take the gallop, gradually increasing in speed until within seventy-five to fifty yards of the enemy, when the charge is sounded and the line rushes forward at full speed, the men yelling and the trumpet sounding.

In former times, the charge did not extend over more than 800 yards including the walk, trot and gallop; but owing to the long-range guns and rifles of the present, large bodies of cavalry cannot often be held in hand without great exposure at a less distance than 4,000 yards from the enemy. With small bodies the distance may, of course, often be much less; but the distance is generally so great, that it is now conceded that cavalry, to be worthy of the name, must even be able to pass over four or four-and-a-half miles at the more rapid paces (trot and gallop), and then have enough energy left to make a charge and carry it through.

On open ground the rapid advance must naturally begin at a greater distance than when sheltering features of ground protect the cavalry from the enemy's fire. Against formed cavalry, the trot should be continued to within a few hundred yards, in order that the cohesion of the line and the simultaneity of the shock may not be destroyed by a long gallop. The gallop, in fact, should not, as a rule, begin sooner than may be necessary to give a proper impetus to the charge; for a long gallop distresses the horses, and when they are blown and exhausted the cavalry is at the mercy of the enemy. In PONSONBY'S famous attack with the Union Brigade at Waterloo, he charged with great gallantry through and through the columns of French infantry (which had recoiled from the attack on WEL-LINGTON'S left), reached the great battery in the French position, and was sabering cannoneers and horses, when, just as the force of the charge was completely spent, he was struck by the French lancers

and cuirassiers. The exhausted cavalry was completely and easily overthrown, the French horsemen making mere sport of overtaking and dispatching the retreating British troopers.

When the attacking line charges, the support takes the full gallop; and when at a proper distance, it charges against the flank or an intact organization of the enemy. The reserve is not habitually thrown into action except to meet an unexpected flank attack, or take advantage of an opening to strike the enemy on the flank. In a large force—such as a brigade or division—the reserve takes advantage of natural obstacles to screen itself from the view and fire of the enemy; but it must not lose sight of the attacking line or of the commander, nor must it get so far to the rear that it cannot respond quickly to his orders. If in column, the reserve forms line of columns at deploying intervals when the attacking line charges, and it assumes the functions of the support when the latter charges.

In the charge, the officers lead, except when the revolver is used, in which case they take their positions on the flanks or in rear of their subdivisions. Every unoccupied detachment of cavalry near the charging body should join it without orders to do so, unless it has been stationed at a certain point for some particular object. Even then, the commander of the detachment must decide as to which is his paramount duty in the case, and must be prepared to accept the consequences of any error of judgment on his part. An error inspired by zeal and bravery is generally easily pardoned.*

In all cases, and especially when infantry is the object of the attack, the enemy should be shaken by artillery fire (generally from horse batteries), which should be continued until the charging cavalry masks the front of the guns.†

When the charge is successful, the enemy is pursued by the support and reserve, the first line rallying and acting as a support to the pursuing force. In the case of an unsuccessful charge, the attacking line should so withdraw as to avoid collision with the support and reserve, which should both attack the pursuing force in flank. The attacking line then rallies, and comes up to act as a support to its former support and reserve.

Influence of the Terrain.—The influence of the terrain is greater

* In the great cavalry battle at Gettysburg, Captain MILLER, of the Third Pennsylvania Cavalry, seeing an opportunity to strike WALKER HAMPTON'S column in flank as it was charged in front by CUTLER, turned to his first lieutenant with the remark: "I have been ordered to hold this position, but, if you will back me up in case I am court-martialed for disobedience, I will order a charge." The charge was opportune and effective, and no mention of a court-martial was ever made.

† See the chapter on Artillery Tactics.

upon the action of cavalry than upon that of infantry, though less, perhaps, than in the case of artillery. The Germans train their cavalry to charge with unbroken ranks over ditches, low walls, and broken ground; but such riding is possible only with a cavalry that is acknowledged to be the most carefully trained in the world. Plowed ground, heavy sand, and wet and swampy soil, will retard, and in some cases check, the charge of cavalry. It is a mistake to suppose that open, level, ground is the best for cavalry action; for on such ground surprise is impossible, and the fire of infantry and artillery has an unbroken sweep. Undulating ground, if not broken by woods, inclosures, or other obstacles, is the best, as it affords very considerable shelter without impeding the force of the attack. A charge may be made down a slope of less than five, or up a hill of not more than ten degrees. A combination of open and inclosed ground is favorable for a cavalry attack, provided that passages exist by which the columns may go from one clear space to another, and open ground suitable for the charge exist immediately in front of the place of collision. The worst possible ground is that which impedes the progress of the cavalry without affording shelter from the enemy's fire—such as the ground over which MICHEL's cuirassiers charged at Wörth, where rows of trees cut down close to the ground, and deep ditches, impeded the movement of large bodies in close formation, whilst the infantry had a perfectly open range over the gentle slopes of the otherwise exposed heights."*

The extent of the ground will have a great influence on the formation of the attacking cavalry. For a charge in line, there should be room enough laterally for deployment and for flank attack; failing this condition, the charge must be made in a different formation. In any case, there should be room enough to the front to enable full headway to be gained for the charge, and for the *mêlée* and rally; and to the rear there should be no insurmountable obstacle on which the cavalry, in case of reverse, might be forced back.

Ground Scouts.—A knowledge of the ground is imperatively necessary for the cavalry leader, for a charge made over unknown ground frequently results in serious disaster independently of the efforts of the enemy. At Shiloh, FORREST charged against a body of United States infantry, and came within forty paces of them when he found his progress checked by an impracticable morass, in which the horses became entangled and from which some of them could not be extricated. The charge thus came to naught without any damage whatever having been done to the opposing infantry. In a

* German official account.

similar manner, the Prussian Fourth Hussars, at Königgrätz, charging over unknown ground, came, while in full gallop, upon a gully which had been concealed from view by the high standing grain, and nearly all were precipitated headlong therein, the charge thus coming to a disastrous end.

To avoid such accidents, ground scouts should be sent forward to reconnoiter the ground. These men, who should be selected for their intelligence, daring and power of quick observation, move at a considerable distance to the front, and communicate by signal with the commander. The duty is an extremely hazardous one, but the occasion generally demands it, and even if all the scouts should be killed or wounded, the loss would be justified by the preservation of the command from disaster. When the charge begins, the scouts clear away from the front at a run, and take position on the flanks. In many parts of the United States it would be found necessary to equip the ground scouts with nippers with which to cut wire fences. Combat patrols consisting of two or three men each, should be sent out to the flanks to give timely notice of threatened attacks by the enemy. The men composing these patrols should have the same qualifications as the ground scouts. Whenever a body of cavalry halts in the presence of the enemy, it should send out ground scouts and combat patrols at once.

Flank Attacks.—Of cavalry charges it may be said without material error, that only flank attacks give decisive results. Indeed, as VON SCHMIDT declares, ten men on a flank are worth more than a hundred in front; and all cavalry movements in the charge should aim to strike a hostile flank either directly or in conjunction with the front attack.

The flank attack may be made either by a portion of the line overlapping that of the enemy and wheeling inward, or by a detached force making a direct attack upon the hostile flank. The former method is dangerous when the force does not exceed that of the enemy; for in order to overlap with one flank, the other must be similarly exposed to the enemy. The second method generally produces the most decisive results, but it can be effected only by surprise. This, however, is not always difficult, as by utilizing the various features of the terrain it is often possible to get within a comparatively short distance of the opposing force without being seen; and this is especially the case when the attention of the hostile troops is taken up with a body of menacing cavalry in its front. Opportunities for direct attacks upon a flank are often presented by a body of cavalry engaged in an attack. At Gettysburg, a charging column

of Confederate cavalry, consisting of the brigades of FITZHUGH LEE, HAMPTON and CHAMBLISS, while opposed in front by CUSTER with only a single regiment, was assailed in flank by several regiments of Union cavalry, and driven back.

A charge on the enemy's flank in conjunction with a front attack is more effective just after the clash of the two opposing lines than when simultaneous with it. The two lines rebound from the shock, horses frequently being turned "end over end" and crushing their riders underneath them, and the opponents then interlock in a *mêlée* which often lasts only one or two minutes, and rarely continues more than five or ten. If the flank attack can strike just at the moment of the rebound from the collision in front, it may ride down the disordered line, and sweep it off the field before it has a chance to recover from the first shock.

Time for Attack.—In a cavalry charge the first consideration is that the attack should be opportune. A timely attack in a poor formation and over unfavorable ground is worth more than the most perfectly prepared and conducted charge made either prematurely or after the "golden moment" has passed. If the attack be made too soon, the enemy will be found unshaken and unsurprised; if made too late, the confusion, bad position, or other unfavorable circumstance, of the enemy will be found remedied, and the opportunity will be lost. By a charge in the nick of time, KELLERMAN with only four squadrons, saved the day for the French at Marengo. MARMONT, who was an eye-witness of the attack, says that a difference of three minutes sooner or later would probably have rendered the charge useless.

It is necessary, therefore, that a cavalry leader should be a man of keen observation, quick decision, and such resolution that he will never shrink from taking the initiative when the fleeting opportunity for a successful charge presents itself. Good cavalry leaders are the rarest of all military men.

THE CHARGE IN COLUMN AND AS FORAGERS.

When not made in line with support and reserve in echelon, the charge should be made in a column of subdivisions, the distance between which should be such as to admit of each rendering timely support to the one in front, without being so close as to be compromised in its defeat. Until the time of deploying for the charge, the rear subdivisions should be in small columns, so as to leave openings for the first line in case of defeat. The subdivisions charge successively, the leading unit if repulsed or broken by the shock, endeavoring

ing to clear the flanks of the column and form in rear. The charge in column of subdivisions may be made in column of platoons, column of troops, column of squadrons, or in a line of such columns. A charge in column of subdivisions gives a succession of shocks falling in the same place, and is preferable to the attack in line, unless the latter offers an opportunity for an attack on the hostile flank, either direct or in conjunction with a front attack.

It is of vital importance that the subdivisions be not too close. At the battle of Solm (September 30, 1745), fifty Austrian squadrons were formed in three lines, with distances of only twenty yards. The Prussian cavalry charging them squarely in front, threw the first line in confusion upon the second, and the combined lines upon the third, and swept the whole mass in disordered rout from the field.

The charge in column of subdivisions was frequently used in the War of Secession, the most celebrated instance of its use being at Gettysburg, where the brigades of HAMPTON and LEE, charging in close column of squadrons, were met by CUSTER in the same formation. On this occasion the especial weakness of a charge in this formation—the exposure of the flanks—was also manifested. It is with a heavy and dense column of cavalry as with a similar column of infantry. It cannot be actuated by a single impulse, and every trooper added to increase its mass adds to the number of individual wills it contains, and the number of individual impulses of self-preservation to be overcome. Its progress depends mainly on the courage and skill of the few men in front, who cannot easily be pushed on by those in rear without incurring disorder, while the fall of a single trooper in the column is likely to throw into confusion all in rear. If the column were a solid body influenced by a single mind, its force would be in proportion to its mass; but under actual conditions, none but small columns can, as a rule, be used.

Nevertheless, charges have been made successfully in column of fours, even by forces as large as a regiment; and the nature of the terrain may often be such as to present the alternative of using cavalry in this formation or not using it at all. At Boonsboro, Md., in 1862, Colonel W. H. F. LEE, in command of the Confederate rear guard, charged with the Ninth Virginia Cavalry in column of fours, through the streets of the village, where no other formation was possible, and succeeded in his object of checking the Union pursuit. In this charge, a considerable interval was left between the squadrons, and each, as it was broken by the shock of the charge, returned to the rear and re-formed, the attack thus taking the form of a series of shocks. A similar charge was made by the Third Virginia Cavalry

at the battle of Kelly's Ford, in 1863. Many other instances in the same war might be noted.

In charging in column of fours, each four takes the extended gallop when the one next preceding has gained the distance of one horse's length. The charge may be made in double column of fours, when the ground does not admit of a charge on a wide front, and the front of a single four seems inadequate. In such a case, the saber and revolver might be combined, the men on the left flank of the column using the latter weapon, as the left is the weak side of a swordsman.

The charge as foragers may be made from either close-order or extended-order line, the troopers using either saber or revolver, and charging in couples with intervals of about six yards. A reserve consisting of not less than one-fourth of the command should be kept in hand in close order. This method of charging is adapted to wooded and broken ground, and is also employed to lessen the target presented to infantry or artillery fire, to annoy and occupy the enemy for the purpose of gaining time for the deployment of troops in rear, or in pursuit of a defeated enemy. If the enemy's cavalry turn and break without awaiting the shock, the charge may be checked and a rapid pursuit be made by foragers, the rest of the command following in close order.

CAVALRY AGAINST CAVALRY.

While the use of cavalry against the other arms on the battle-field will, probably, not be so great as it was formerly, the number of cavalry battles will doubtless be much greater. The success of a campaign depending upon proper screening and reconnoitering duty, and this in turn depending upon the superiority of the cavalry over that of the enemy, each army will strive at the outset to overthrow the mounted force of its opponent. Hence, as so often prophesied, the next great war will begin with a cavalry battle of considerable magnitude. Moreover, the constant attempts to break through the screen of the enemy, and to thwart him in similar attempts, will lead to continual encounters between the screening troops, until finally, when the armies arrive within the presence of each other, the cavalry of each will uncover the front, and withdraw to positions on the flanks. From these positions, the cavalry, accompanied by horse artillery, will endeavor to gain the flanks, or even the rear, of the enemy, for the purpose of creating a diversion; and it will aid and support every attempt to attack the enemy's flank, and use every endeavor to prevent similar attacks in return. This will often lead

to such great cavalry combats as those on the flanks at Gettysburg and Mars-la-Tour.

Again, it being the duty of the cavalry of a defeated army to cover the retreat, and of that of the victor to conduct the pursuit, almost every great battle will close with an engagement of cavalry. At Eckmühl, forty Austrian squadrons fought the French cavalry for more than three hours, and thus gained time for the Archduke's army to retreat across the Danube. At Koniggrätz, when the Austrian army was shattered by the concentric attack of the Prussians, when most of its guns had been captured, when its infantry was in full flight, and its line of retreat was threatened, its cavalry threw itself upon the pursuing cavalry of the Prussians, and, under cover of the long struggle which ensued, the defeated army withdrew in safety across the Elbe. "It is beyond a doubt," says HOENIG (a Prussian officer), "that this cavalry knew the fate which awaited it, surrounded as it was on three sides by the fire zone of breech-loaders. It was sure to be defeated at last, but the well delivered stroke had a tremendous tactical effect. It relieved the pressure on the retreating army and saved it from the utter rout which would undoubtedly have followed if the Prussian cavalry had remained master of the field, or had not been attacked as it was. This is not a case for flattering national sentiment, but for reviewing the events calmly, truthfully, and justly, and anyone who considers the attacks of the Austrian cavalry in this way will unhesitatingly conclude that it carried out most successfully one of the most difficult tactical duties which has ever fallen to the lot of cavalry. Cramped and shut in, it attacked the Prussian cavalry, in spite of a ceaseless flank fire of breech-loaders, forced its way right up to the infantry line of an army already intoxicated with the assurance of its great victory, and brought the whole Prussian line to a standstill."

The best opportunities for a cavalry attack upon the enemy's cavalry is when the latter is issuing from a defile and presents a narrow front; when it can be surprised in a column formation; when it can be taken in flank while charging another body; when it is exhausted; while it is changing formation, or when it is on ground unfavorable to its deployment. In the latter case, the ground, while unfavorable to the deployment of the enemy, must, of course, offer no obstacle to that of the attacking cavalry—for instance, the enemy may be emerging from a wood into an open plain on which the attacking cavalry can readily deploy, while the enemy's deployment is still obstructed by the wood.

It is evident that the combats of cavalry with cavalry will gener-

ally be fought by the cavalry divisions. The divisional cavalry will habitually be used in conjunction with the other troops of the division, and will rarely be engaged in a pure cavalry fight, except when united with the cavalry divisions in screening duty, in the pursuit, or in covering the retreat, or when employed in defending the divisional artillery from an attack by the enemy's cavalry.

CAVALRY AGAINST INFANTRY.

While it may be set down as an axiom that good, intact, infantry, plentifully supplied with ammunition, and not taken by surprise, cannot be broken by a cavalry charge, however gallantly made, the fact remains that many opportunities will still be presented in war for the use of cavalry against infantry; for infantry is not always good, it is not always intact, it is not always supplied with ammunition, and its surprise, though more difficult than formerly, is still by no means impossible. Cavalry may be used with effect against infantry under the following circumstances:

I. *When the infantry is demoralized or of poor quality.*

Inferior infantry is not only unable to deliver the effective fire on which the defeat of a cavalry attack depends, but it is susceptible in the highest degree to the moral effect produced by the charge. A notable instance of the effect of a cavalry charge upon inferior infantry is furnished by the battle of Somosierra (Nov. 30, 1808). It is best described in the words of NAPIER: "At daybreak three French battalions attacked St. JUAN's right, three more assailed his left; as many marched along the causeway in the center supported by six guns. The French wings spreading over the mountain side commenced a skirmishing fire, which was well returned, while the frowning battery at the top of the causeway was held in readiness to crush the central column when it should come within range. At that moment NAPOLEON rode into the mouth of the pass; his infantry was making no progress, and a thick fog mixed with smoke hung upon the ascent; suddenly, as if by inspiration, he ordered the Polish cavalry of his guard to charge up the causeway and seize the Spanish battery. The foremost ranks were leveled by the fire of the guns, and the remainder thrown into confusion; but General KRAZINSKI rallied them, and, covered by the smoke and the morning vapor, led them sword in hand up the mountain; as they passed, the Spanish infantry on each side fired and fled toward the summit of the causeway, then the Poles took the battery, and the Spaniards

abandoning arms, ammunition and baggage, fled in strange disorder. This exploit, so glorious to one party, so disgraceful to the other, can hardly be matched from the records of war. It is almost incredible that a position nearly impregnable, and defended by twelve thousand men, should from a deliberate sense of danger be abandoned to the wild charge of a few squadrons which two companies of good infantry should have effectually stopped. * * * The charge viewed as a simple military operation was extravagantly rash; but as evincing NAPOLEON's sagacious estimate of Spanish troops, and his promptitude in seizing the advantage offered by the smoke and fog which clung to the side of the mountain, it was a felicitous example of intuitive genius."

II. *When the infantry can be taken by surprise.*

At the battle of Custoza (June 24, 1866), a squadron and a half of Austrian lancers surprised an infantry brigade, and so completely routed four of the five battalions of which it was composed, that they were of no further use in the battle.

During the German autumn maneuvers in 1879, a regiment of lancers charged suddenly from behind some rising ground, and surprised four battalions of infantry, who did not see them until they were on the flank only two hundred yards away, and in full charge. Scarcely a shot was fired, and the Emperor and VON MOLTKE ruled three battalions out of the fight.* In other words, it was decided by the highest military authority in existence, that 3,000 good infantry, taken completely by surprise, could be routed by 600 cavalry.

III. *When the infantry is out of ammunition.*

At the battle of Eylau (February 7, 1807), AUGEREAT's corps, while its fire-arms were wet with the falling snow, was attacked by a large force of Russian cavalry, aided by a heavy artillery fire, and was almost annihilated. An infantry force at the present time could not, it is true, be at all affected by wet fire-arms, but it is liable to exhaust its ammunition, and it will then be as helpless as the infantry of AUGEREAT. With the exhaustion of its ammunition, infantry is set back six centuries in its efficiency, and becomes a tactical anachronism of which the cavalry can take advantage.

IV. *When the infantry is broken by the fire of the opposing infantry or artillery.*

At Austerlitz, the infantry of BAGRATION having been long engaged with the infantry of LANNES, was charged by KELLERMAN's cavalry and driven from the field.

*MAURICK.

V. *When the infantry is engaged with opposing infantry.*

At the battle of Winchester (September 19, 1864), the Confederate infantry, while engaged with the United States infantry in front, was struck in the flank by MERRITT's cavalry, and routed with great loss.*

VI. *To compel the infantry to take up such a formation as to present a good target to the fire of the opposing infantry or artillery.*

Near Almeida, in 1811, a brigade of French infantry was attacked by a British force consisting of six squadrons and a battery of horse artillery. Continually menaced by the cavalry, the brigade was compelled to form squares, thus presenting a target on which the battery played with such deadly effect that the French were compelled to withdraw with severe loss. This mode of action will be profitable when the infantry is in extended order with unprotected flanks, and its use in future wars will probably not be rare. When the employment of cavalry is combined in this manner with that of infantry, it is necessary that the latter arm be used with vigor.

VII. *To check an attack of the enemy's infantry and gain time for the arrival of reinforcements.*

This is one of the most important duties, and certainly the most dangerous one that cavalry can be called upon to perform, and it should never be required, except when the necessity of gaining time is so imperative as to justify the sacrifice of the troops making the attack.

At Chancellorsville (May 2, 1863), when STONEWALL JACKSON had struck the flank of the Eleventh Corps, and was sweeping everything before him in dire confusion and panic flight; when any sacrifice was necessary to stem the torrent of disaster; a charge by the Eighth Pennsylvania Cavalry, under Major PENNOCK HUEY, upon the advancing Confederates, though repulsed with great loss, gained time for General PLEASANTON to assemble a battery of twenty-two guns, with which JACKSON's onset was checked. Probably no more valuable use of cavalry was made during the entire War of Secession.

A similar, but much more celebrated charge, was made at Mars-la-Tour (August 16, 1870). The Germans, in inferior numbers, were struggling to hold their own until reinforcements could arrive. CANROBERT's corps completely overlapped BUDDENBROCK's division, and a flank attack by the French seemed imminent. In order to

*See preceding chapter.

secure a point of support for his menaced flank, BUDDENBROCK accordingly endeavored to occupy some wooded and broken ground to the front with his main body; and the greater part of his division was there engaged in an obstinate fight with the French infantry, when he was informed that another French corps was coming up on the right of CANROBERT, thus doubly increasing the danger of a flank attack. It was now necessary at any cost to gain time for the arrival of the Prussian Tenth Corps, which was approaching the field. To this end, General BREDOW was ordered to charge the French infantry with his cavalry brigade. One of his regiments having been detached, he had at his disposal only the Seventh Cuirassiers and the Sixteenth Uhlans; and some Prussian infantry in the Tronville copses in front having been mistaken for French, two squadrons were sent against them, thus further diminishing the attacking force to six squadrons. The brigade, thus reduced to half its strength, advanced toward Vionville (see map) in close column of squadrons, the cuirassiers leading. Crossing the road at a point west of Vionville, it changed direction half-left to the low ground north of the village, and deployed to the right: the cuirassiers being on the left with nine platoons in line, and two echeloned to the left rear, the Uhlans on the right with all squadrons in line and echeloned slightly to the rear of the cuirassiers. The deployment executed, the brigade wheeled slightly to the right and advanced at a gallop: four batteries of horse artillery posted west of Vionville concentrating their fire upon the enemy's batteries, and so engaging their attention, that BREDOW arrived near the guns with but slight loss. Only two pieces of the first battery had time to fire before the Prussian horsemen were among the guns, cutting down cannoneers and horses, and completely silencing the battery. Without stopping to make prisoners, the cavalry charged on, struck another battery in rear of the first, and dashed through the supporting infantry squares, riding down two and breaking up several others. Owing to the fury and excitement of the collision, the squadrons had become disordered and out of hand, and they continued the charge, overtaking a retiring mitrailleuse battery, sabering the drivers and horses, and pushing on to the second line of infantry. But just as the troopers were becoming thoroughly exhausted and the horses blown with the fatigues of an attack, in which they had passed over a distance of 3,000 yards, they were struck in counter-charge by French hussars and chasseurs on the right, and cuirassiers on the left. The German horsemen were violently thrown back, and a confused mass of cuirassiers, Uhlans, hussars, chasseurs and dispersed infantry men, thrusting,

cutting, shooting, and yelling, went whirling back through the guns of the batteries, the rallied infantry opening fire whenever friend and foe were sufficiently separated to offer a target, and the French cavalry ruthlessly cutting down their exhausted opponents. When the remnants of Bazez's command reached the Prussian position, it was found that the casualties, out of a force numbering 800 sabers, were 379 officers and men killed, wounded, and missing. The result of the charge was worth the loss; for the French right was checked, the German reinforcements arrived, and nothing more was seen of the movement which had threatened to sweep BUDDENBROCK'S division from the field.

VIII. *When the infantry is exhausted by a prolonged contest with infantry.*

In a determined contest of infantry against infantry, the fatigue of a long advance over broken ground, and the excitement, turmoil, noise, and appalling losses of a fire combat at close range, subject the combatants to such physical fatigue and mental strain at the crisis of the fight, that their exhaustion is often marked by a distinct lull in the battle. If at such a time, the infantry can be charged by cavalry, the latter should have every chance of success; for the nerves of the infantrymen are overstrained, and they are no longer in a condition to use their weapons with effect. If at the battle of Gravelotte, the French cavalry, instead of standing idle behind the left, had been posted on the right near St. Privat, it might have circled out and attacked the Prussian Guards when they were exhausted and shattered by their repulse, and there is every reason to believe that the German attack at that point would then have failed completely.

IX. *When infantry is disordered in retreat.*

The mere fact of infantry being in retreat does not justify cavalry in charging them; for if the retreating force be not demoralized or disintegrated it will probably inflict heavy loss upon the attacking cavalry. It is only when the retreating infantry is thoroughly beaten and demoralized, as at Jena or Waterloo, that the cavalry can charge them successfully and break down their resistance. When the retreating infantry is still intact and in good heart, the cavalry in pursuit should limit its action to threatening demonstrations.

X. *In covering a retreat.*

Here it may be merely a question of gaining time: and intact infantry may, therefore, be attacked with the deliberate intention of sacrificing the charging cavalry for the purpose of enabling the other troops to escape. The attack, if skillfully made, may under favorable circumstances, result in checking the pursuit altogether. On the day after the battle of Shiloh, FORREST, covering the Confederate retreat with about 350 troopers, observed that a pursuing force, consisting of a regiment of infantry and two battalions of cavalry, was thrown into some confusion in crossing a stream, boldly charged it, and the moral effect of his audacious assumption of the defensive, combined with the losses inflicted, practically stopped the pursuit, though the charge was finally repulsed.

XI. *To cut through a surrounding force of hostile infantry.*

This use of cavalry is generally a desperate one, and is made as the only alternative to surrender. The chances are in favor of its failure, but there have been instances of its successful employment. At Lovejoy, Ga., (August 20, 1864), KILPATRICK finding his raiding force of 4,800 cavalry (two divisions), surrounded by 12,000 Confederates of all arms, determined to cut his way out. The hostile infantry had formed in three lines, about fifty yards apart, in double rank, and had constructed barricades of fence rails. The first division of the Union cavalry was formed with the leading brigade in line of regiments in column of fours at deploying intervals, the other brigade in column of fours. The second division followed in column of fours. The leading brigade was covered by two troops deployed as skirmishers, who threw down an intervening fence, and appear generally to have performed the functions of ground scouts. The charging columns lost their formation, the men rushing to the front, and (according to a Confederate account) "charging in a solid column, ten or twelve lines deep, running their horses, and yelling like devils." The Confederate cavalry did not wait to receive the charge, but broke in confusion, and KILPATRICK'S cavalry dashed over and through the three lines of opposing infantry, capturing a battery of artillery, three flags and 400 prisoners, and rejoining SHERMAN without further serious molestation from the Confederates.

Moral Effect of Threatened Attack.—By merely hovering in the vicinity of the enemy and threatening attack, his infantry may sometimes be temporarily checked and valuable time gained. At Gettysburg (July 1, 1863), HOWARD ordered BUFORD to go to the support

of DOUBLEDAY's sorely pressed corps. It seemed hopeless to attempt anything against the long lines of hostile infantry, but BURROUGHS quickly moved out into plain view of the enemy and formed for the charge. The Confederates at once formed squares, which caused them to delay and aided in the withdrawal of the First Corps, probably saving a large portion of it from capture.

A similar result was produced by the Austrian cavalry at Custozza. Two Austrian brigades of cavalry charged shortly after 7. A. M., upon two Italian divisions, consisting of thirty-six battalions, and, though compelled to retire, shook the Italians up so badly that they had to be supported by another brigade. The cavalry then remained in front of these divisions all day, and kept them so thoroughly on the defensive that they were unable to advance to the aid of the rest of the army. In this case, 2,400 cavalry kept 25,000 infantry out of battle all day; but it is to be observed that the best of cavalry was here opposed to a poor quality of infantry.

Formation for Attack.—Infantry in masses or in line in close order should be attacked in line of columns or in successive lines at about 100 yards distance, the lines as nearly equal as practicable, successive waves of cavalry being necessary to prevent the infantry from re-forming when the charge has passed over it. When the infantry is in extended order, it should be charged by foragers, supported by about half of the force in close order; the latter to advance in reinforcement, or form a rallying point in case of repulse.

In charging infantry, cavalry should take the shortest line, but should endeavor, from the first, so to shape its course as to strike the infantry in flank. In attacking the infantry in front, the cavalry should endeavor to approach from the right of the infantry, as the oblique fire of the latter is less effective towards its right than towards its left. It is also an advantage in attacking infantry, to charge up a slight slope, as the bullets are in such a case likely to pass over the heads of the advancing troops. In attacking infantry, it is necessary that the gallop should be taken much sooner than in attacking cavalry, as it is of the utmost importance to diminish the time of exposure to the hostile fire.

In attacking infantry, the cavalry must be careful not to mask the fire of its own infantry and artillery; otherwise the charge might, under some circumstances, be of positive benefit to the enemy. HOHENLOHE mentions the following incident: "An infantry officer who was present told me, with regard to a cavalry charge at Wörth, that at the moment our infantry were falling back down a slope from an attack which had failed, a hail of chassepôt and mitrailleuse

bullets followed them, and everyone felt that he would never reach the cover of the wood which lay below. Tired to death and resigned to their fate, the whole of the infantry were slowly crawling towards this wood. Suddenly the murderous fire ceased. Everyone stopped, astonished to see what had saved them from the fate which seemed certain to them. Then they saw the French cuirassiers, who, as they pushed forward, masked the fire of their own infantry and artillery. These cuirassiers appeared to them like guardian angels. With the most perfect calm every man halted on the spot where he stood and fired at the cuirassiers, who were soon swept away by the rapid fire.* In this case an ill-advised charge upon repulsed, but not demoralized, infantry played completely into the hands of the enemy.

The Use of Cavalry Against Infantry not a Thing of the Past.—

There is no reason to believe that cavalry will not frequently be used against infantry in the wars of the near future. Those critics who would rule cavalry off the battle-field because of the disasters of the French horse in charging intact infantry at Wörth and Sedan, should remember that the same era that saw the Mamelukes annihilated by the French infantry at the Pyramids, and BLÜCHER's cavalry wrecked against DAVOUT's squares at Auerstädt, witnessed the decisive charges at Marengo, Austerlitz and Borodino. Granting, as we must, that front attacks of cavalry against good, intact, infantry are out of the question, there are, nevertheless, eleven distinct cases, as enumerated above, in which cavalry can be profitably used against infantry. The employment of cavalry in these cases will certainly often subject it to great loss, but it is everywhere acknowledged that under the conditions of the modern battle-field, infantry must incur enormous losses in attack, and there is no reason why infantry should be expected to face death more cheerfully than cavalry should. Infantry can profit by the shelter of the terrain, and so can cavalry. Infantry does not present so good a target as cavalry; neither does it pass over the ground so rapidly. The physical effect produced by the fire of attacking infantry is lacking in the case of cavalry; but the moral effect of a cavalry charge is greater than that of an infantry attack. Cavalry still has a great future before it on the battle-field; but it must have clear-headed, quick-witted and fearless leaders, and it must be good cavalry, not merely brave men on horseback.

CAVALRY AGAINST ARTILLERY.

Of artillery, as of infantry, it may be said, that, if unshaken, well prepared, abundantly supplied with ammunition, and composed

*"Letters on Cavalry." Letter VI.

of good troops, it should not fear a front attack of cavalry. Nevertheless many opportunities will occur in battle in which artillery may be attacked by cavalry with every prospect of success.

I. When artillery, hurried into action, is unsupported by the other arms.

It is the tendency of modern tactics to hurry the artillery into action and deploy the army under the protection of its guns. The artillery is habitually massed in huge batteries, the corps and divisional artillery being often united in a line of guns more than a mile in length. If the artillery be audaciously hurried forward without proper escort—as at Sedan, where a great German battery of 200 guns was, for several hours, under the protection of a single regiment of cavalry—an opportunity will be presented for cavalry to move up under the shelter of various features of the terrain, make a sudden dash, and break the line of guns, capturing or damaging the pieces, causing confusion, and giving the enemy an impression of disaster at the very beginning of the fight. Even though a front attack might in this case be necessary, a certain amount of protection could be found in the element of surprise and the difficulty of altering the elevation of the guns to meet the rapidly changing target afforded by the cavalry as it rapidly approaches, now in plain sight, and an instant later concealed by the undulations of the ground.

In the battle of Tobitschau (July 15, 1866), an aide-de-camp looking for a passage across the Blatta Brook, found a dilapidated bridge, and at the same time discovered that an Austrian battery of eighteen guns was without any support. BREDOW (then a lieutenant-colonel) at once led three squadrons across the shaky bridge and advanced upon the battery, two Prussian horse artillery batteries at the same time opening fire on the Austrian guns. The attention of the Austrians being attracted to the Prussian batteries, BREDOW moved straight for the front of the hostile guns, with one squadron in the attacking line, one as a support in echelon on his left, and the third as a reserve to the right rear. The undulating ground afforded considerable shelter until the cavalry was close up to the guns, and a few rounds of grape nervously fired at the last moment produced but little effect upon the charging cavalry, who dashed into the battery, sabered cannoneers and drivers, and captured eighteen guns and 168 men. The cavalry lost only ten men.

A similar attack upon artillery for the purpose of compelling it to abandon its position was made by the French at Mars-la-Tour.

It is thus described by BONIE: "About 4:30 P. M., whilst our troops were engaged in front, one of the enemy's batteries was detached to take us in flank, and with that object took up a position on the road itself, nearly in a line with the Grèyère farm: in order to avoid being turned it was absolutely necessary to silence this fire. * * * Immediately General DU BARAIL passed over the ravine that lay in his front, with the Second Chasseurs d'Afrique, wheeled to the left, and charged the battery in skirmishing order. The enemy had scarcely time to fire, before our men were on them. The Second sabered the gunners as they fled, and still continuing their advance, they came in contact with a superior force of the enemy: they managed, however, to disengage themselves by going off to the right; and rallying in the angle formed by the wood and the road, they opened a sharp fire on the enemy. After this brilliant feat of arms the battery was no more seen."*

II. When in the course of the battle the infantry supports have been driven back, or have exhausted their ammunition, and the artillery stands alone.

An opportunity of this kind was open to the French at Mars-la-Tour [Vionville]. It is thus spoken of by VON DER GOLTZ.

"When, in the evening of the battle of Vionville, the dusk descended, and scarcely anything more could be discerned of the infantry on the wide battle-field, and the great masses of the artillery on the center, more than 100 guns strong, stood defenseless, a similar thought, [How if the enemy's cavalry should now appear?] arose in our breasts. It appeared impossible to check a resolute cavalry charge that might have hurled itself upon these batteries. This view of the case was one of the reasons for dispatching all our available cavalry against the enemy."†

III. When the artillery can be surprised, especially while limbering up or in the act of unlimbering.

In these cases the artillery is manifestly practically helpless, if not supported by the other arms.

Formation for Attack.—In attacking a battery, the cavalry is divided into two or three parts. The attacking line charges as foragers, divides near the center as it advances, and assaults the battery on each flank, attacking the cannoneers and the battery support. The support advances to secure the battery. The reserve

* "The French Cavalry in 1870" (translated by THOMSON), page 53.

† "The Nation in Arms" (translated by ASHWORTH), page 261.

follows in close order, and is held in hand to repel a counter charge should one be made. If the escort consists of cavalry, the attack on the guns must be made in extended order, but the support must be attacked by a force in close order. If the battery be in position, the cavalry should always endeavor to strike it in flank or rear. Generally a troop or squadron will be sufficient for the attack of a single battery. In any case, the defeat of the support is necessary to complete the capture of the battery. At Brandy Station (June 9, 1863), the Sixth U. S. Cavalry and the Sixth Pennsylvania Cavalry charged upon the Confederate artillery. "Never," says Major McCLELLAN, "rode troopers more gallantly than did those steady regulars, as under a fire of shell and shrapnel, and finally of canister, they dashed up to the very muzzle, then through and beyond our guns, passing between HAMPTON's left and JONES's right. Here they were simultaneously attacked from both flanks, and the survivors driven back.*"

Measures to be Taken on Capturing a Battery.—Cavalry may attack a battery, either with the object of capturing it, for the purpose of disabling it, or for the purpose of causing it so much annoyance as to compel it to change its position. The cavalry, once in possession of a battery, should endeavor to carry it off. If this be impossible, the guns should be disabled,† and the horses and limbers carried off if practicable; if this cannot be done, the horses should be killed and the traces cut. When a gun is limbered up and retreating, an attempt should be made to shoot one or more of the horses of the team, preferably the leaders.

DEFENSIVE USE OF SHOCK ACTION.

Shock action, from its very nature, belongs to the offensive; but it may be used in counter-charge as a part of a general defensive plan. The flanks of the infantry and artillery must be protected from surprise by the enemy's cavalry, which should be taken in flank or vigorously assailed in front when it attempts to strike. In such a case, the advantage of position is with the cavalry of the defensive, as the place where it is to be used can be known beforehand, and it can often be stationed in a position affording shelter, concealment, and proximity to the point of action.

* McCLELLAN'S "Campaigns of Stuart's Cavalry," page 268.

† To disable a field gun, open the breech-block and then break it with a heavy hammer; or load the piece, close the breech without locking it, and fire the piece; or place two or three blank cartridges in the gun, close and lock the breech-block, ram from the muzzle a ball of clay or sod, then unlock the breech-block and fire; or, fire a shotted gun with its muzzle against the chase of another. Guns of the Krupp system may be temporarily disabled by carrying off the breech-block or breaking the handle of the breech-block."—U. S. Cavalry Drill Regulations, par. 966.

Divisional cavalry may sometimes be used defensively with effect at the crisis of the fight, to delay the opposing infantry, or even to check it altogether; this being a case of the use of cavalry against exhausted infantry. The best time for a counter charge by the divisional cavalry is, however, at the moment when the enemy has penetrated the position, as the effect of the infantry fire of the defender is then kept up until the last moment, and the counter charge strikes the enemy at the instant of his greatest disorder.

The local defense of cavalry is possible only with fire action.

DISMOUNTED ACTION.

The dismounted fire action of cavalry may be usefully employed for the following purposes:

1. To drive away or capture small bodies of infantry or partisan troops, who endeavor to check the progress of raiding or reconnoitering cavalry.

The difference in self-reliance and power between a cavalry that cannot use effective fire action and one that can, is shown in the following instances where cavalry found its way blocked by irregular troops:

"On the 23d of December, the Eleventh Cavalry Brigade, consisting of a cuirassier, dragoon and Uhlan regiment, was brought to a standstill before the village of Vibray. The dragoon officer in command of the advance guard reporting the village to be occupied by infantry, General von BARBY decided, as it was getting dark, to bivouac his brigade for the night before the place. The next morning, my squadron relieved the dragoons and took the advance guard of the brigade, I being ordered to command the advance guard of the squadron. The orders I received were: 'Vibray is still occupied; if you are fired upon, send one man back to report, leave two to watch the road we are advancing on, and gallop through the town with the remainder.' We were fired on, and I galloped through the town, receiving a parting volley, fired from their horses, by a dozen Chasseurs d'Afrique, who then made off in the opposite direction. Here is an instance of a whole cavalry brigade stopped by twelve mounted riflemen."*

"At the little town of Corydon, Colonel MORGAN's advance guard found a body of militia posted behind rail barricades. He charged them, but they resolutely defended their rail piles, killing and wounding several men. * * * A demonstration was made upon the flank of the enemy by one regiment of the second brigade, and Colonel MORGAN again advanced upon their front, when, not under-

* Captain LUMLEY, late Thirteenth Prussian Uhlans, in *Journal of the Royal United Service Institution*.

standing such a fashion of fighting upon two or three sides at once, the militia broke and ran, with great rapidity, into the town, their progress accelerated (as they got fairly into the streets) by a shot dropped among them from one of the pieces."*

II. *To force a defile which blocks an advance, and thus avoid a delay.*

On the retreat from Gettysburg, STUART, finding the pass of the Catoctin Mountains, near Cooperstown, Md., occupied by United States troops, dismounted a large portion of his command, and, fighting from crag to crag, finally forced the passage.

III. *To seize and hold localities until the arrival of infantry.*

At Gettysburg (July 1, 1863), BUFORD, discovering the approach of the enemy, and realizing the value of the position, dismounted his cavalry, and stubbornly held his ground against heavy bodies of Confederate infantry until the arrival of the First Corps.

IV. *To reinforce infantry in emergencies.*

The incomparable BUFORD illustrated this use of cavalry also at Gettysburg. In his official report, he says: "After the fall of General REYNOLDS, whose advance troops partially drove back the enemy and made heavy captures of prisoners, the enemy brought up fresh troops, and engaged General DOUBLEDAY's command, which fought bravely, but was greatly outnumbered and forced to fall back. Seeing our troops retiring, and their need of assistance, I immediately rushed GAMBLE's brigade to DOUBLEDAY's left, and dismounted it in time to render great assistance to our infantry, and to check and break the enemy's line. My troops at this place had partial shelter behind a low stone fence, and were in short carbine range. Their fire was perfectly terrific, causing the enemy to break and rally on their second line, which made no further advance toward my position."

V. *To fill a gap in the line of battle.*

At Wagram (July 6, 1809), NAPOLEON finding that the Austrians were making dangerous progress on his left, withdrew MASSENA's corps from the center of his line, and moved it to the left, filling with cavalry the gap thus formed until he could occupy it with artillery. Such a use of cavalry would now be vastly more practicable, the cavalry dismounting and taking the place of the infantry in

*DUMER'S "History of Morgan's Cavalry," page 435.

every sense of the word. Indeed, had the present conditions then existed, the cavalry would probably have been moved to the left, and MASSENA would not have been withdrawn.

Similarly, cavalry may occupy a position for the purpose of relieving infantry, and causing the enemy to believe that the position is still held in force.

VI. *In an inclosed, wooded, or broken country, where mounted action is impracticable.*

Innumerable instances of this use of cavalry because of the impracticability of using it mounted might be cited from the history of the War of Secession. The most striking, perhaps, was the use of WILSON's entire cavalry corps dismounted at the battle of Nashville (December 15-16, 1864).

VII. *In covering a retreat.*

Describing the pursuit of Hood's army after Nashville, General WILSON says: "HATCH's column had not gone more than two miles when its advance, under Colonel SPALDING, encountered CHALMERS' cavalry strongly posted across the road behind a fence-rail barricade. They charged it at once, and a spirited hand-to-hand *mêlée* ensued, in which many men were killed and wounded on each side. * * * The gallant Confederates were driven in turn from every fresh position taken up by them, and the running fight was kept up till nearly midnight. CHALMERS had, however, done the work cut out for him gallantly and well. He was overborne and driven back, it is true, but the delay which he forced upon the Federal cavalry by the stand he had made was sufficient to enable the fleeing Confederate infantry to sweep by the danger point that night, to improvise a rear guard, and to make good their retreat the next day."*

VIII. *When exhausted or defeated cavalry is called upon to resist a charge of fresh cavalry.*

At Upperville, Va. (June 21, 1863), GAMBLE's cavalry brigade, having been repulsed in a charge upon superior numbers of Confederate cavalry, retired a short distance, quickly dismounted, took a position behind a stone wall, and repulsed with its carbine fire several charges of the opposing cavalry.

IX. *In conjunction with cavalry mounted.*

At Aldie (June 17, 1863), Colonel MUNFORD, commanding a brigade of Confederate cavalry, posted a force of dismounted caval-

*"Battles and Leaders of the Civil War," Vol. IV., page 469.

rymen behind a stone wall perpendicular to the front of the mounted troops. The United States cavalry, charging upon the mounted Confederates, received a heavy fire from the dismounted men, and being driven back by a counter charge, were again subjected to a biting fire in their retreat.

At Okolona (February 22, 1864), FORREST, holding his antagonist in front with a dismounted force, made a decisive mounted charge against his right flank.

X. Whenever cavalry, through force of circumstances, is deprived of the power of using mounted action.

When the cavalry of BAZAINE's army, shut up in Metz, had lost its horses from starvation, the dismounted men were armed with chassepôts, and drilled to work as infantry. With cavalry armed and trained as most of the cavalry of the present day is, any catastrophe causing the loss of the horses could be promptly met by making use of the cavalry dismounted, without any additional drill.

Increased Value of Dismounted Action.—The increased value of dismounted fire action is due solely to the increased range of fire-arms. With the old muzzle-loading, smooth-bore, weapons it would have been almost impossible for cavalry to do any effective work on foot, and then mount and withdraw. Dismounted fire action was accordingly limited to a very few objects, such as forcing a passage or defile against inferior numbers of foot troops, or in defending some similar position to the last extremity. Cavalry can now, however, dismount and subject the enemy to a destructive fire from a range of 1,000 yards to that of 200 yards, and still have time, if pressed by superior numbers, to mount and withdraw in safety.

Formation.—To prepare for dismounted action, the cavalry is always formed in column of fours or in line of columns of fours, usually one man of each four holding the horses, and the rest of the command forming for action to the right, left, right-front or left-front of the column. A mounted reserve is retained for such mounted action as circumstances may require. It may be charged with the protection of the led horses, or the latter may be intrusted to a designated detachment or detachments.

The proportion of men dismounted is generally three-fourths of the whole command, excepting the mounted reserve, but depends upon the degree of danger to which the horses are exposed, and the amount of mobility required of them, as well as the amount of fire action required of the dismounted line. It may be necessary to keep as many as half of the men mounted; and on the other

band, when a strong firing line is imperatively necessary or the horses are well sheltered and likely to remain stationary, seven-eighths of the force (excepting the mounted reserve) may be put in the firing line, each horse holder being intrusted with the horses of an entire squad. The horse holders usually remain mounted, but when charged with the care of many horses, or in order to obtain shelter, they may be allowed to dismount. The horses should never be exposed to direct fire if it can possibly be avoided; but they should be kept as near the line as considerations of protection permit, and they should not be moved unless a material change is made in the position of the dismounted men. The horses should be kept under cover in rear of their respective subdivisions, and it is very important that they should be brought up to the line (or remain standing) in the same formation that they were in when the troopers dismounted; otherwise there will be confusion and delay at a time when haste is urgent.

The dismounted men are maneuvered and fought in essentially the same manner as infantry, the fighting line consisting of skirmishers, support and reserve. The latter is in addition to the mounted reserve. When the squadron is in action as a part of the regiment, there is no mounted squadron reserve, except such mounted guard as may be necessary for the led horses.

Offensive Action.—As a rule, the cavalry approaches as near as possible to the enemy before dismounting. It should at least be able to remain mounted until it encounters artillery fire. The attack on foot is conducted according to the principles already prescribed for infantry; but the dismounted force should put as many carbines as practicable in the firing line from the first, and should close with the enemy as quickly as possible. When the hostile position is carried, the dismounted men should at first merely hold it, the mounted reserve pursuing, and the led horses being brought up to the position. The attacking force is then assembled as soon as possible, and may either mount and follow the mounted reserve in pursuit, or prepare to defend the position from counter attack. Whenever a sufficient number of mounted men can be spared, an attempt may be made, in conjunction with the dismounted attack, by the mounted reserve against the enemy's flank or rear.

Even when the attack is to be made on foot, ground scouts and combat patrols (mounted if practicable) should always be sent out, for the change from dismounted to mounted action is one for which the cavalry should always be prepared. The ground scouts should be drawn in when the fight begins, the patrols remaining on the flanks.

Defensive Action.—When dismounted cavalry is acting on the defensive, the whole of the reserve should, as soon as the enemy's attack is developed, be put in the firing line, unless there be danger to the position at other points. If attacked by a superior force, the defenders should discontinue the action in time to mount and retire to another position, unless ordered to hold on at all hazards. In defending a bridge, street, or defile, the dismounted cavalry should construct barricades, and, as a general rule, cavalry should intrench whenever it is on a pure defensive.

If opposed to mounted cavalry (as in the eighth case mentioned above), the cavalry on the defensive should endeavor to subject it to an annihilating magazine fire at short range, a reserve being kept mounted. If the assailants are thrown into confusion by the fire, or if they attempt to dismount, an opportunity may be offered to the reserve to charge them, or to attack their led horses.

As a rule, cavalry should avoid engaging in a dismounted fight with infantry; but should an emergency demand such action, it should endeavor to make up for its inferior shooting power by its superior mobility. Cavalry may often, by celerity of movement and skill in utilizing concealing features of the terrain, be able to strike the flank of a marching column of infantry, which it can annoy and throw into disorder with its fire, gradually withdrawing from the firing line as the infantry becomes engaged, and mounting and retreating before it can receive heavy loss in return.

Dismounted fire action adds immeasurably to the independence and fighting power of cavalry, and is an indispensable part of the functions of that arm; but, great as its importance is, it is only the complement of mounted action, and must never be regarded as the chief use of cavalry.

MOUNTED FIRE ACTION.

Mounted fire action with the carbine is here considered. The pistol may be used in shock action in place of the saber.

Mounted fire action may be used as follows:

- I. *As a means of temporary resistance by small scouting parties, or by the point and flankers of an advance guard.*
- II. *In the pursuit of a beaten enemy, when a mounted charge is impracticable.*
- III. *In covering a retreat when the pursuit is so active and so strong as to make it unsafe to dismount and inexpedient to charge.**

*See the subject "Mounted Fire Action," in the chapter on "The Characteristics of the Three Arms."

IV. *When the opposing cavalry is charging over heavy and unfavorable ground.**

Mounted fire action may be used by cavalry in close order, but the habitual formation for this mode of fighting is in extended order, the skirmishers being deployed with intervals of four yards.

Mounted fire action is the least effective use of cavalry, and it may be well to repeat that it should never be used when either shock action or dismounted fire action is practicable.

THE EFFECT OF SMOKELESS POWDER ON CAVALRY TACTICS.

The absence of smoke on the field of battle will deprive cavalry of one of its best means of surprise; and it will be more difficult than heretofore to bring the squadrons unshattered up to a point from which their charge can be launched with effect. A field with a suitable combination of concealing features and good charging ground is, consequently, more necessary than ever. Reconnaissance will be more difficult than formerly, as the scouts will be plainly visible, while the difficulty of obtaining shelter from the fire of an unseen enemy will be great. Under the increased danger, the scouts will probably often shirk their duty, and the engagement may thus begin without the position of the enemy being well known. The duties of ground scouts will be more difficult and dangerous than ever.

There is, however, one compensating advantage—a great one—for the cavalry, in the fact that the absence of smoke will make it possible to form a more correct estimate of the condition of the enemy than was possible under the old conditions. Shaken and demoralized infantry will no longer be concealed by a friendly mantle of smoke, and if the cavalry be within striking distance, it will be an easy matter to seize the opportune moment for a charge.

CAVALRY RAIDS.

The subject of raids belongs really to the strategic service of cavalry; but this duty is so important and so intimately connected with the various tactical uses of cavalry that it may well be considered in connection with tactics.

Cavalry raids are undertaken for one or more of the following objects:

*See the description of the use of mounted fire action by the 20th Chasseurs à Cheval at Eylau in the next preceding chapter.

- I. *To threaten or destroy the communications of the enemy, thus compelling him to weaken himself for their protection, or delay his advance.*

The operations of MORGAN and FORREST against the communications of the Army of the Cumberland after the battle of Murfreesboro, and FORREST's threatening movements toward SHERMAN's communications in 1864, exemplify this use of cavalry raids.*

- II. *To check an invading army by operations against its communications and the capture of its immediate base of supplies.*

In December, 1862, GRANT, operating against Vicksburg from the north, was in the vicinity of Oxford, Miss. His base of supplies was at Columbus, Ky., his immediate base being at Holly Springs, Miss. FORREST left Columbia, Tenn., on December 11th, and, in a three weeks' raid, wrecked sixty miles of the railroad between Jackson, Tenn., and Columbus, cutting off GRANT's communications with Columbus and Washington for twelve days, and completely interrupting the transportation of supplies for a much longer period. At the same time, VAN DORN, with the entire cavalry force of his army, 3,500 men, moved from Grenada, around GRANT's left, and captured Holly Springs, with its garrison of 1,500 men, where he destroyed an enormous quantity of stores, valued at \$1,500,000, and retreated in safety to Grenada.

These combined operations of FORREST and VAN DORN constitute, perhaps, the most successful and profitable raid ever undertaken. The region in which the armies were operating was exhausted, and the destruction of the depot and the railroad by which further supplies could be accumulated, compelled GRANT to abandon his movement against Vicksburg and fall back upon Memphis.

In a similar manner, raids may be made for the object of compelling the enemy to abandon a position by cutting the railroads on which he depends for supplies. The raids of STONEMAN, MCCOOK, and KILPATRICK, in the Atlanta campaign, were for this purpose, but were unsuccessful.

- III. *To make a diversion in favor of the main army by drawing off troops in pursuit of the raiding force.*

After the battle of Antietam (September 17, 1862), LEE's army, diminished in numbers and suffering from its disastrous check, had crossed into Virginia, and it was of great importance that it should have time for recuperation before again confronting the Army of the

* See the next preceding chapter for a sketch of these operations.

Potomac. STUART, with a select force of 1,800 cavalry, recrossed the Potomac, and in a raid of three days, passed completely around McCLELLAN's army, captured Chambersburg, destroyed a vast quantity of public property, seized 1,200 horses, and captured 280 prisoners.

"Not the least important of the results of this expedition," says STUART's biographer, "was its effect on the physical and moral condition of the Federal cavalry. As to its physical results, General McCLELLAN sufficiently describes them when he says in his report, that it was necessary for him to use all of his cavalry against STUART, and that 'this exhausting service completely broke down nearly all of our cavalry horses and rendered a remount absolutely indispensable before we could advance on the enemy.' On the 6th of October, General McCLELLAN had received positive orders 'to cross the river and attack the enemy.' He was unable to execute these orders until the last days of that month. His correspondence with General HALLECK shows that the condition of his cavalry was one of the chief causes of this delay."*

- IV. *To gain information.*

In June, 1862, McCLELLAN's army was on the Chickahominy awaiting reinforcements. LEE, contemplating an offensive movement, sent STUART "to make a scout movement to the rear of the enemy," the object being mainly "to gain intelligence of his operations, communications, etc.,"† with incidental instructions to capture trains, destroy supplies, etc. Beginning his raid on the 12th of June, STUART reported to General LEE on the 16th, having made a circuit around McCLELLAN, in the course of which he captured a few prisoners and destroyed a considerable quantity of United States property.

"The greatest results, however, were those which followed from the information obtained by STUART. All doubt as to the location of the Federal army was solved, and the possibility was demonstrated of those movements which, on the 27th of June, culminated in the defeat of the Federal right wing at Cold Harbor."‡

- V. *To cause alarm in the enemy's country, and thus destroy confidence in the enemy's commanding general, or create a sentiment unfavorable to the prosecution of the war.*

The greatest result of STUART's Chickahominy raid was, however, a moral one. It caused a great commotion and excitement through-

* "Campaigns of Stuart's Cavalry."

† Official instructions of LEE to STUART.

‡ "Campaigns of Stuart's Cavalry."

out the Army of the Potomac, and shook the confidence of the North in McCLELLAN.*

The raid of MORGAN into the Northern States, in the summer of 1863, was undertaken with a view (among other objects) to bringing home to the people of the North "something of the agony and terror of invasion," and in connection with LEE's invasion of Pennsylvania, to give such an impression of Confederate success as to strengthen the opposition of a faction in the North to continuing the war. In this object it failed signally; for though great excitement and alarm were caused among the inhabitants of Indiana and Ohio, no assistance was received from the anti-war element in those States, and MORGAN's entire command was dispersed or captured. His raid had, however, the effect of keeping employed for a number of weeks a force of United States troops many times larger than his own command, and thus deprived ROSECRANS of reinforcements that would have sufficed to turn Chickamauga into a Union victory.

VI. *To interfere with the mobilization and concentration of the enemy's forces at the beginning of a campaign.*

Raids for this purpose should be made by small forces, as their object will generally be the destruction of a bridge, viaduct, tunnel or lock, and celerity will be of paramount importance, in order that the raiding force may escape the large bodies of troops concentrating in the theater. This kind of raids may often be made by mere expeditionary patrols.†

VII. *To devastate the enemy's country and destroy his resources.*

The best illustration of such an operation is the great raid of WILSON in the spring of 1865.‡ A raiding force employed for this purpose should be large—in fact, an army of cavalry able to fight a battle, and resembling an ordinary raiding column only in its independence of a base or depôts of supply.

VIII. *To effect the release of prisoners.*

In February, 1864, KILPATRICK moved against Richmond with a raiding force, consisting of 4,000 cavalry and a battery of artillery, for the purpose of making a dash upon the Confederate capital and releasing the Union prisoners confined there. He reached the outskirts of Richmond, but was unable to effect his object. One of the

*See "The Civil War in America," by the COMTE DE PARIS (American edition), Vol. II., page 83.

†See "The Service of Security and Information," page 126 et seq.

‡See the next preceding chapter.

objects of STONEMAN's unsuccessful raids in Georgia, in 1864, was the release of Union prisoners confined at Macon and Andersonville.

When raids are undertaken for this purpose, it is necessary to avoid embarrassing the raiding column with a mass of unarmed prisoners on foot. The raid will be unsuccessful unless the prisoners can be quickly conducted to some point of safety near at hand, or can be provided with arms, and thus form a reinforcement sufficient to enable the raiding force to repulse any attack that is likely to be made upon it.

When Raids are Practicable.—Raids are rarely practicable in the enemy's country. In the War of Secession the only raids on Northern soil were STUART's Chambersburg raid, which was of only three days' duration, and MORGAN's great raid, which resulted in his own defeat and capture. It being necessary to obtain information in order to elude the hostile forces pursuing or endeavoring to head the raiding column, it follows that in a hostile country a raiding force is operating in the dark while its adversaries have every advantage. In Tennessee and Kentucky, MORGAN was always well informed of every movement of the United States forces; but after he crossed the Ohio River he found it utterly impossible, moving as rapidly as he was forced to do, and in the midst of a strange and hostile population, to get positive information regarding any matter.*

The raiding columns of United States cavalry in the South met with an advantage not often found in an enemy's country; for while the white population was intensely hostile, the slaves were, as a rule, more than willing to give information, and act as guides or spies. This limitation of raids to a friendly country is all the more certain when the belligerent nations speak different languages. Raids of French cavalry against the communications of a German army invading France should be perfectly feasible; but if the French were invading Germany, they would doubtless find raiding exceedingly difficult. The objection of some European authorities† to making raids in a thickly populated region may be dismissed at once with the remark that cavalry that cannot overcome the resistance of home guards, *franc-tireurs*, or armed peasants, is not fit for raiding, however valuable it may be on the field of battle.

The allurements of adventure offered by a raid furnish a temptation to every true cavalry leader, but it is a temptation that should be resisted unless the object justifies the raid; for aside from the peril of capture (which may be evaded by courage and skill) there

*DUKE.

†Notably VON DER GOLTZ and HOHENLOHE.

exists the danger of the demoralization of the command by a spirit of depredation, or of its being for some time rendered unserviceable by the fatigues and exhaustion of raiding duty. Above all, is the risk of being absent from the army when a decisive battle occurs. Many of the raids in the War of Secession, being undertaken without an adequate object, or not conducted with skill, terminated in disaster.

In STUART's Chambersburg raid, his entire command marched eighty miles in twenty-seven hours. In MORGAN's great raid, his command averaged for some days twenty-one hours a day in the saddle, and on one occasion marched ninety miles in thirty-five hours. "The men in our ranks," says General DUKE, "were worn down and demoralized with the tremendous fatigue, which no man can realize or form the faintest conception of until he has experienced it. It is as different from the fatigue of an ordinary long march, followed by some rest, as the pain given by an hour's deprivation of water is unlike the burning, rabid thirst of fever." In General WILSON's raid against the railroad junction at Burkesville, Va., in June, 1864, with his own and KAUTZ's cavalry divisions, the command marched over 300 miles and destroyed sixty miles of railroad in ten days. General KAUTZ says that for nine days and nights his men were in the saddle, or destroying railroads, and were so tired that every exertion of the officers was necessary to keep them awake even under the enemy's fire. Many were captured asleep on the road.*

The object must be an important one to justify such demoralizing fatigue and the consequent necessary rest for recuperation. VAN DORN's raid upon Holly Springs had an object worth any sacrifice; for it decided a campaign, and a great battle could have done no more. Even if his success had been gained with the loss of every trooper in his command, the raid would have been worth its cost. On the other hand, STUART's third raid around the Army of the Potomac, though successfully effected, was a positive misfortune to the Confederates; for it caused his absence from LEE's army on the first day of the battle of Gettysburg, when his cavalry would have been of incalculable value. In a similar manner, an ill-timed raid of FORREST, in compliance with Hood's orders, "to drain the country of persons liable to military service, animals suitable for army purposes, and subsistence supplies," caused his absence from the battle of Nashville, and doubtless contributed materially to the defeat of the Confederate army.

Composition and Preparation of a Raiding Force.—A raiding force

* Official Report, July 4, 1864.

should be composed of well-mounted, well-disciplined, self-reliant, troops, sufficiently toughened by service to be able to endure the greatest hardships. It should consist of complete organizations, instead of detachments from different ones, and should usually vary in numbers from 1,000 to 3,000 men. When quick work, requiring absolute secrecy, is the object, the force employed may be very small; when, on the other hand, the expedition is for the purpose of devastating a region and destroying the enemy's resources, the force must be large.* As the force should be strong enough to brush away the hostile bodies met in its path, and small enough for mobility, the resistance likely to be encountered should be carefully considered, and the strength of the raiding column regulated accordingly.

As a rule, no infantry should form a part of a raiding column. If a deficiency in cavalry render the employment of infantry necessary, the latter should be transported in wagons or mounted on impressed animals. A few guns may often be used with great advantage on a raid, but they should consist of horse or mountain artillery, and should not, as a rule, exceed two guns to 1,000 cavalry.

A raiding force should always count upon living upon the country; but, to meet emergencies, a reserve of supplies for a few days should invariably be carried along. The commander of the raiding force should compute as accurately as possible the number of days for which he should be compelled to provide his command with supplies in the event of the enemy's resistance, or other emergency, preventing him from foraging, and should carry half rations and half forage for such number of days. These supplies should be carried by a train of pack mules; for a wagon train with a raiding column may be characterized as an unmitigated nuisance. A single pack mule will carry one day's half rations for 160 men, and one day's half forage (grain) for thirty-five horses. Each trooper might be required to carry as much as five days' full rations on his own horse, and he should invariably be required to carry 200 rounds of carbine ammunition and an extra pair of horse shoes. Pioneer tools and explosives, for use in the destruction of railroads, bridges, tunnels, etc., should be provided and carried in the pack train.

The objective of the raid should be definitely determined, and the commander should know beforehand just how he is to attain it. It is always well to have an alternative objective, so that in case it

* MORGAN's first raid into Kentucky was made with 900 men; his great raid with 2,400. STUART's raiding columns varied in strength from 1,500 to 2,000 men; his great Chambersburg raid being made with 1,800. GRISWOLD's raiding column numbered 1,800 men. WILSON's command, including KAUTZ's, in the Burkesville raid consisted of a force of 3,500. WILSON made his great raid through Alabama and Georgia with 13,000 men; and SHERIDAN had 10,000 troopers under his command in his raid against the James River Canal.

should be impossible to attain the principal object, the accomplishment of the second will prevent the raid from being altogether fruitless, and will even give it the appearance of success—a matter of no small importance in its effect upon the enemy and upon the morale of the raiding troops. Everything possible should be done to obtain a clear knowledge of the region through which the raid is to be made, and to gain information while in it. It was the custom of MORGAN to send scouts and spies into the region in which he intended to operate, where they remained, familiarizing themselves with everything pertaining to its roads, bridges, resources, and the location of hostile troops, until the raiding column arrived, when they were at once ready to act as guides. For manifest reasons, this plan would not work well in a hostile country, where it would probably be necessary to impress guides at all hazards.*

Conduct of the Raid.—But little can be prescribed for the conduct of a raid, as each expedition will present its own peculiar circumstances to which the operations must conform. Except in the case of a very large raiding force, it is generally advisable to march in a single column, in order that the force may be kept well in hand; for in moving with the rapidity required in raids, the junction of parallel columns in critical emergencies could not be counted upon with any degree of confidence. The main command should be in constant readiness for action. Individual scouts and small patrols should be kept well out to the front and flanks, and small parties (not exceeding in the aggregate more than one-third of the command) should be sent out to forage and seize horses, to replace those which may become exhausted and broken down. Receipts should be given for all forage, provisions and horses taken, in order that the people may present to their own government claims for remuneration; and no family should be left in want. A tendency to plunder is likely to spring up in a raiding column, even if composed of the best of troops;† and it should be promptly and sternly repressed not only from motives of humanity, but to prevent the demoralization of the command.

If circumstances render a detachment necessary for any purpose, its commander should be clearly instructed not only in regard to

* For the manner of selecting and using guides in a hostile region, see "The Service of Security and Information," page 10, *et seq.*

† General KAUFZ, in his official report of his raid of May 5 to 17, 1864, says: "The fighting qualities of the men I have never seen excelled, and in this respect I can congratulate the whole command without distinction. I have, however, to deplore a disposition to pillage and plunder on the part of some of the men, and a want of proper officering on the part of some of the officers to check this tendency."

the object he is to accomplish, but also what he should do in case it becomes impossible to rejoin the main column. Detachments should not be made without some important object; for the commander must always regard as very possible the definite separation of the detachment from his command.

For the leader of a raiding force, secrecy, celerity and resolution should be the motto; for his command, discipline and endurance are the two essential qualities.

DESTRUCTION OF COMMUNICATIONS.

The principal destructive efforts of a raiding force will be directed against railroads, bridges, tunnels, locks and ordinary roads.

Bridges.—To destroy a bridge, a charge of gun-cotton should be exploded in the haunches of an arch, or if time does not admit of this, in the crown of the arch. Iron girder bridges can be most easily destroyed by placing the charges under the supports.

Railroads.—The following manner of destroying a railroad is based on the method employed in the War of Secession. The men are divided into sections, several hundred men in each. The first section is distributed along the track, one man at each tie, and at a given signal, the entire piece of track thus manned is raised to a vertical position. At a second signal, the track is thrown over so that the rails are underneath and the ties on top. Each man next loosens his tie from the rail, and the section moves on to another portion of the track. The second section now takes its place at the portion already torn up, collects the ties in piles of about thirty each, and places the rails on the top of the piles, the center of the rail over the center of the pile. Fire is then set to the piles, and the second section follows the first. The third section now comes up, takes the place of the second, and when the rails are sufficiently heated, removes them, two men to each rail, with "railroad hooks" or pinchers, and bends them around trees or posts, at the same time twisting them. The third section now follows the second, which, continuing the work of the first, has by this time another lot of rails ready, and the work is thus carried on to completion. When the road is well ballasted, preliminary work with pick and shovel will, of course, be necessary.

The rolling stock should be burned, blown up, or run at full speed to a broken bridge and precipitated into the river. When haste is urgent, rails may be broken, here and there, by exploding gun-cotton against them, or by removing the outside rail on a curve.

This would, however, be only a temporary impairment of the road, worthy of an expeditionary patrol, but not of a raiding column.

Tunnels.—An effectual way of blocking a railroad—at least temporarily—is by blowing in a tunnel. The tunnel should be blown in at several places simultaneously, or beginning at the center and blasting at different points to the end.

Telegraph.—A line of telegraph may be destroyed by cutting down the poles, cutting the wires, and breaking the insulators. It may be temporarily disabled by winding together the wires (first scraped clean) with fine wires.

Locks.—The gates of a lock can easily be destroyed with gun-cotton. If time permits, the lock can be more permanently damaged by blowing in the walls at the sides.

Ordinary Roads.—Ordinary roads can be blocked by felling trees across them, or by blowing up the roadbed.*

RÉSUMÉ.

The tactics of cavalry is more varied than that of any other arm. It embraces shock action in line and in column; fire action mounted and on foot; a combination of fire and shock action either mounted or dismounted; and the simultaneous use of fire action dismounted and shock action mounted by different parts of the same command. The arms, training, and tactical formations of modern cavalry adapt it to use on varied ground, and in every phase of the battle, and sustain General KILPATRICK's apothegm, that "cavalry can fight anywhere except at sea."

* For detailed instructions in regard to hasty demolitions, etc., see the "Manual of Field Engineering," prepared at the U. S. Infantry and Cavalry School.

NOTES ON THE MECHANICAL PRINCIPLE OF THE BIT.

BY FIRST LIEUTENANT E. E. GAYLE, SECOND ARTILLERY.

CHAPTER IV., Part II., of Major DWYER'S "Seats and Saddles, Bits and Biting," is devoted to the bit and its appurtenances; the first part of the chapter to a discussion of the mechanical principle involved, namely, that of the lever, from which conclusions are drawn that seem to be generally accepted as authoritative and final. That these conclusions are correct is attested by the universal favor with which the bit, resulting from them, is received; but that they are the logical sequence of the discussion is highly improbable, for the reason that the argument contains many statements wholly erroneous; it seems that the conclusions must first have been assumed and afterwards an attempt made to devise an argument to fit them. The following notes are made with a view to correcting some of these statements, and to affording a closer insight into the application of the mechanical principle involved. Below are quotations from the chapter, for purposes of ready reference:

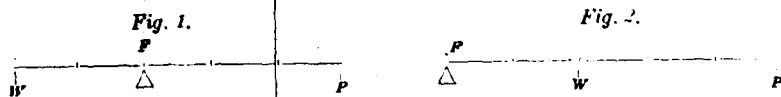
"Applying this (the principles of a lever of the first order) to a bit, the bars of which represent a lever, * * the power is applied to the lower ring to which the rein is attached, * * the fulcrum or prop must be represented by the bars of the horse's mouth on which the mouth-piece acts, and the pressure of the curb on the chin would represent the weight to be raised. But it has been shown that in levers of the first order, the power and weight move in *opposite* directions in their rotation about the prop; in this case, therefore, the horse's chin, in consequence of the pressure exercised by the curb, should move forward. Now, in fact, there is no *weight to be raised* in the purely mechanical sense of the expression—it is the question of the infliction of a certain amount of pain from which the horse shrinks; and if the curb act *more painfully* than the mouth-piece, in consequence of its construction or position, we obtain the action of a lever of the first order, which we should never desire.

"A lever of the second order is what we want for biting; the weight in this case is represented by the pressure on the bars of the

mouth, the curb acting merely as a fulcrum, the horse's head follows immediately the pressure on the bars of the mouth in the direction of the rider's hand. It is, however, quite possible to spare our horses the infliction of torture merely by adjusting our bits altogether on the principle of a lever of the second order—that is to say, by converting the curb into a simple prop or fulcrum for the lever action on the bars of the mouth, which may be effected by rendering it (the curb) perfectly painless, so that then the small amount of pressure exercised on the bars, acting in the proper direction, and not being counteracted elsewhere, is the sum total of pain it becomes necessary to inflict, and even this may be reduced to a minimum."

To say that we will adopt a particular order of lever and arrange the bit to fit it, as it were, is absurd; the principle upon which the bit acts is fixed, it is the same now as it has always been; lengthening or shortening the arms to produce greater or less pain; increasing or diminishing pressure on the bars or chin-groove do not affect it in the remotest degree; as it exists and is a lever, the question is to determine to which order of lever it does belong, impose our conditions, deduce our results, and from them determine the proper relation of its different parts.

The following figures 1 and 2 represent levers of the first and second orders respectively:



In their analogy to the bit *P* would represent the power applied to the reins, *W*, in Fig. 1, the resistance offered by the curb, and in Fig. 2 the pressure on the bars of the mouth. It is a well known principle of the lever that the power is to the resistance, a weight, inversely as their respective lever arms; if the levers are five inches long and the forces are applied at points indicated we would have, with a pull of five pounds at *P*, from the proportion $P:W::WF:PF$, *W*, in Fig. 1, equal to seven and one-half pounds, and in Fig. 2 to twelve and one-half pounds; in other words it would cause a pressure of seven and one-half pounds on the chin-groove, and twelve and one-half pounds on the bars of the mouth. This is under the supposition that the forces at *P* and *W* are applied in a direction perpendicular to the axis of the lever.

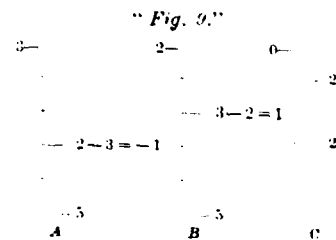
The statement quoted above that if the curb act more painfully than the mouth-piece, in consequence of its construction or position, we obtain the action of a lever of the first order, is wholly erroneous; neither the construction of the curb nor its position, in the sense above used, has the slightest connection with the order to which the

lever belongs. It would be just as reasonable to say if the curb act more painfully than the mouth-piece, in consequence of its having spikes on its surface or being attached to the horse's throat, we obtain the action of a lever of the first order. This savors very much of the logic in the famous argument of Mr. REPPENHAGEN anent the hanging of the anarchists and the United States government. It is then stated that "what we need for biting is a lever of the second order, and that our horses may be spared the infliction of torture merely by adjusting our bits on its principles,—that is to say, by converting the curb into a simple prop or fulcrum for the lever action on the bars of the mouth." In short, the abstract idea of selecting a lever of the second order to represent the bit, has rendered the curb painless—has removed from it all harmful pressure. This is the idea conveyed for no mention is yet made as to the form of the curb itself, only as to its position.

Following these statements three diagrams are given in Fig. 3, here reproduced, to demonstrate the truth of these conclusions:

It is stated that "if a power equal to 5 be applied to the reins, 3 parts will act on the curb, and 2 on the mouth; this is shown at A."

Let us see how the principle of the lever supports this statement. As this is a lever of the second order, the lever arm of the power 5 applied at the reins is the entire length of



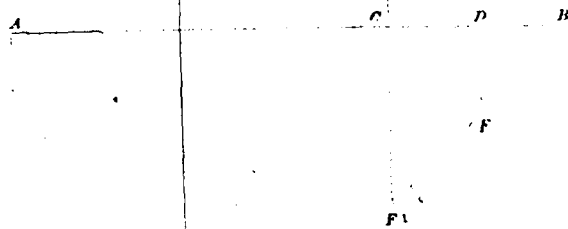
the bit, say 5 inches; the lever arm of the weight, represented by the intermediate arrow, is 3 inches; hence, we have the proportion $5:2::3:5$ or $6=25$. The same state of affairs obtains at B. The next diagram is beyond our comprehension; just what amount of force it is necessary to remove from the curb to reduce its painful action to zero could not readily be determined short of an interview with the horse who, with his proverbial sense, would probably suggest that it should all be removed; this would necessitate no pull on the reins and we would be, so to speak, at a stand-still.

Apart from the incorrect statements and demonstration above referred to, the essential characteristic of the lever seems to have been wholly ignored. A lever is defined to be a simple machine, consisting of a bar or rigid piece of any shape, acted upon at different points by two forces which severally tend to rotate it in opposite directions about a fixed axis called the fulcrum.

To illustrate more in detail, let *AB*, Fig. 3, represent the axis of the

bit, *A* the point of attachment of the reins, *B* that of the curb-strap, *BF*¹ the position of the strap, and *C* the mouth-piece. If *ABF*¹ were perfectly rigid we could assume any point as *C*, *B*, *F* or *F*¹ as the fulcrum; with the power at *A*, applied as indicated, and *C* as the

Fig. 3.



fulcrum, *AC* would be the lever arm; with *F* as the fulcrum the lever arm would be the perpendicular distance from *F* to the line of direction of the force *A*, but the lever would be shortened by the distance, *DB*. If *F*¹ be the fulcrum, the line of direction of the force *C* would pass through the fulcrum, and we would have no lever at all. This rigidity does not, however, obtain with the bit and curb-strap considered together, and, therefore, we cannot assume the fulcrum to be at any point of the latter. It will thus be seen that the bit cannot be other than a lever of the first order, and it will be so regarded in the discussion below.

Reading farther along in the chapter we find many common sense statements about the curb, without any attempt to support them by mechanical principles. The following are selected as pertaining to the foregoing criticisms: "It is very clear that the narrower the chain is made the more likely is it to cause pain, which is just what we want to avoid, and we should, therefore, endeavor to make it as broad as possible." "In order to render the action of the curb as painless as possible, it is absolutely necessary that it should press upon the greatest extent of surface that can be made available for the purpose, for which reason, of course, we require this instrument itself to be flat and as broad as the chin-groove will allow." "To reduce pain resource is now had to a particular form of curb and not to any special order of lever."

The opening pages of Chapter IV. convey incorrect ideas as to the relative action of different bits, and in one instance expression has been given such ideas, so as to apparently support the statements above criticised. Reference is made to an article which appeared in

the CAVALRY JOURNAL for December, 1892, under the title, "Graphic Comparison of the Action of the Shoemaker and Dwyer Bits," by Lieutenant ROCKENBACH, Tenth Cavalry. The conclusions arrived at in this article cannot be maintained, for the reason that they are based upon an assumption which is incorrect, namely: that the distances passed over by certain points represent the forces transmitted

to those points. To illustrate: In this diagram, the point *O* represents the bars of the horse's mouth, *D* the attachment of the curb-strap to the bit, *E* that of the reins, and *G* the chin-groove; the lever arm of the force applied at *E* is *EO*, 3.5 inches, that of the resistance at *D* is the perpendicular distance from *O* to the line *DG* or 1.24 inches. The point

E moves 4 inches, or to use the unit of the article, $\frac{3}{8}$ inches; the point *D* moves $\frac{1}{8}$ of an inch; hence, from the principle of the lever we would have $3.5 : 1.24 :: \frac{3}{8} : \frac{1}{8}$ or $1.75 = 4.96$, which is absurd. Again, the point *O* moves $\frac{3}{8}$ of an inch, which represents, comparatively, the force applied to the bars of the horse's mouth. The pressure thus represented cannot

be correct, even comparatively, for the reason that this force cannot be, from the action of the lever, always greater than that acting perpendicularly at the point *E*, and it exceeds this latter force by the perpendicular component of the resistance which acts in the direction *DG*. This component and the corresponding component of the force applied at *E* are two parallel forces acting on the same side of the bit and in the same direction, hence their resultant, whose point of application is *O*, must be the sum of the two. The relations between the forces acting on the bars of the mouth and chin-groove with the Dwyer and Shoemaker bits are given as 22 to 10, and 22 to 26 respectively, while the correct relations of these forces are 15 to 10 and 18.75 to 13.75. See Fig. 4 and 7, herewith.

In illustrating the principles of the lever as applied to the bit, it has thus far been assumed that the forces in question acted in a direction perpendicular to the bit; it is now proposed to discuss them as they are found in practice and under several different conditions. It will be assumed that the height of the bars of the horse's mouth is, as given by Major DWYER, $1\frac{1}{4}$ inches; also, that in each case, the force applied at the reins is such that its component perpendicular to the axis of the bit is five pounds. The dimensions of bits and intensities of forces are drawn to scale.

Fig. 4 represents, in diagram, the Dwyer bit, in which *AC* is 3.5, *CB* 1.75, and *CD* 1.75 inches. Pressures are determined as follows:

The force, five pounds, applied at reins, is to resistance offered by curb-strap at *B*, which we will call *X*, as the lever arm of the latter, 1.24 inches, is to lever arm of former, 3.5 inches, hence $X = 14.41$ pounds; since its line of direction is oblique, by resolving it, in accordance with the principle of the parallelogram of forces, into its perpendicular and parallel components, we find them to be ten pounds each, the former representing the pressure on the chin groove. As previously stated, this component and the corresponding component of the force at *A*, in this case five pounds, are two parallel forces acting in the same direction; their resultant is, therefore, the sum of the two, or fifteen pounds, and since it passes through the point, *C* would be the pressure on the bars of the mouth.

With reference to the other component, ten pounds, determined above, it will be seen that if the point *D* were perfectly free to move, this force would have a tendency to raise it vertically upward; if the point *D* be fixed, this force acting in the direction of the axis of the bit, would have a tendency to move it vertically downward. Since the construction of the bit requires for its proper action that the point *D* be fixed, it will be so regarded. The bit is prevented from moving downward under the influence of this force by cheek-straps, and there would therefore be a pressure of ten pounds transmitted through them to the horse's head as the result of a five-pound pull on the reins.

In Fig. 5 the upper arm of the bit is half as long as that in Fig. 4, or .875 of an inch. We find the following pressures as the result of this change: On the bars of the mouth, 25.00 pounds; on the chin-groove, 20.00 pounds; on the head, 10.02 pounds. In Fig. 6 the upper arm is equal to the lower; Pressures on the bars of the mouth, 10.00 pounds; on the chin-groove, 5.00 pounds; on the head, 10.11 pounds. In Fig. 7 we have the dimensions of the Shoemaker bit: *AC* is 5.5; *BC*, 2, and *CD*, 1.75 inches; pressures are: On bars of mouth, 18.75 pounds; on chin-groove, 13.75 pounds; and on head, 15.67 pounds. It will be seen that the arithmetical sum of the forces brought to bear on the horse by the action of the bit is, in the first case, 35 pounds, of which 42.8 per cent. acts on the bars, 28.6 per cent. on the chin-groove, and 28.6 per cent. on the head; in the second, the total is 55.02 pounds, of which 45.44 per cent. acts on bars, 36.35 per cent. on chin, and 18.21 per cent. on head; in the third the total is 25.11 pounds, of which, 39.82 per cent. acts on bars, 19.91 per cent. on chin, and 40.27 per cent. on head; in the fourth the total is 48.17 pounds, of which 38.92 per cent. acts on bars, 28.53 per cent. on chin, and 32.53 per cent. on head. To com-

pare the relative "severity" of the Dwyer and Shoemaker bits, we find as follows: With Dwyer bit: Pressure on bars, 18.04 per cent.; on chin-groove, 12.02 per cent., and on head, 12.02 per cent. With Shoemaker: Pressure on bars, 22.55 per cent.; on chin-groove, 16.53 per cent., and on head, 18.84 per cent. The weights of the bits have not been taken into account, and as the latter is the heavier, its head pressure would be proportionally increased.

It is interesting to note, in passing, the changes in these pressures due to the play of the curb; that is, the space usually deemed necessary to be left between the curb-strap and chin when the bit is at rest. If this space be such that the finger may be easily inserted in it, it will not be far from half an inch; due to this alone there will be with the Dwyer bit a loss of pressure on the chin-groove of 24.5 per cent., and on the bars, 26.6 per cent; this would be equivalent to a length in the upper arm of the bit of two and one-fourth inches, thus destroying that correspondence in the two dimensions—length of upper arm and height of bars of mouth—said to be of so much importance, and which thus appears to demand a very snug-fitting curb-strap; there is, moreover, a downward pressure on the chin, and an upward pressure on the bars of the mouth, which would appear to be more injurious than beneficial. (See Fig. 8.)

To complete the discussion there is yet another point to be considered, namely, the proper relation between the arms as well as their actual length. This phase of the subject is approached with much hesitancy for the reason that there are several variable quantities, to some of which it is necessary to assign arbitrary value before the problem can be solved. These arbitrary values depend upon individual judgment, which, in turn, depends upon a knowledge of the anatomy of the horse's head and an extended experience with the use of the curb bit. Information in this regard has been obtained from those sources which are thought to be most reliable. Since the values which may be assigned these variables are likely to differ with each individual who attempts the solution of the problem, the conclusions below are submitted as provisional only.

The most important variables referred to are—

First—The amount of force that should be applied at the bars, or that necessary to ensure to the rider perfect command over his horse under circumstances incident to the service; this is regulated with a bit of given dimensions by another variable—the amount of force applied at reins.

Second—The relative sensitiveness to pressure of the chin-groove and top of head.

Third—The length of lower arm as limited by conformation of mouth and line of direction of reins.

Fourth—The length of upper arm as limited by the means of attachment and proper working of the curb-chain.

If it be accepted as a fact that the upper arm of the bit should be equal to the height of the bars, which is said to be of easy mathematical demonstration, the fourth variable might be omitted. This demonstration is, however, by no means apparent. It is stated that "if a flat curb-chain which has a proper width act in this groove, a considerable amount of pressure may be applied without causing any very unpleasant sensation to the horse," and that "the entire action of the bit should be concentrated on the mouth-piece." Referring to the appended diagrams it would appear that a mathematical demonstration would be strongly on the side of a bit in which the relation between the arms approached that given in Fig. 5, for we there have the greatest concentration of pressure on the mouth-piece and the least on the head. It is true we also have a greater pressure on the chin-groove, but, as stated above, this may be considerably relieved by a proper form of curb-chain. The top of the head is popularly believed to be one of the most sensitive points about the horse, and, in fact, it is so held by authorities on the subject, who also state that pressure upon this spot is one of the causes of disease. (See FITZWYGRAM, and Special Report on Diseases of the Horse, Department of Agriculture, 1890.) For this reason it is thought the upper arm of the bit should be as short as possible; if this length is reduced unduly it would interfere with the proper function of the curb-chain, by bringing the latter, in consequence of its width and the yielding nature of the bars and chin-groove, in contact with the joint of the mouth piece and arms, when, as is sometimes necessary, a strong pull is applied to the reins. As to the total restraining force that should be supplied by the reins—a variable to which an arbitrary value must necessarily be assigned—it will be assumed, in the absence of a better guide, that the amount given by the Dwyer bit is sufficient, this assumption being based solely upon the favor with which the bit has been received. Comparing the relative power of this bit with those represented in Figs. 5, 6 and 7, it will be seen from the following table that they stand as follows: 38.89 to 61.11, 58.23 to 41.77, and 42.08 to 57.92 respectively.

	Dwyer and Fig. 5.		Dwyer and Fig. 6.		Dwyer and Shoemaker.		Dwyer and Size 1.		Dwyer and Size 2.	
Chin.....	10.	11.11	10.	16.64	10.	12.02	10.	14.29	10.	14.74
Head.....	10.	11.11	10.	16.64	10.	12.02	10.	14.29	10.	14.74
Bars.....	15.	16.67	15.	24.95	15.	18.04	15.	21.44	15.	22.12
Relative power.....	38.89		58.23		42.08		50.02		51.66	
Chin.....	20.	22.22	5.	8.31	13.75	16.53	10.71	15.30	10.	14.74
Head.....	10.	11.11	10.11	16.82	15.67	18.84	8.56	12.23	7.83	11.54
Bars.....	25.	27.78	10.	16.64	18.75	22.55	15.71	22.45	15.00	22.12
Relative power.....	61.11		41.77		57.92		49.98		48.40	

In other words, the "severity" of the first and third is excessive, while the second is deficient in power.

From measurements taken of a number of horses of Light Batteries "A" and "F," Second Artillery, it appears that for a large proportion a length of three inches for the lower arm would give sufficient play between the horse's lip and bar connecting the arms of the bit. With this as a value for the third variable, we have sufficient data from which to determine the remaining dimension—length of the upper arm; this is found to be 1.4 inches, the relative power to our assumed standard being with this bit as 49.98 is to 50.02, or practically the same, while the relative pressures on top of head are as 12.23 to 14.29. In other words, the bit with these dimensions fulfills the assumed condition of affording sufficient restraining force, while the pressure on the head where it is most harmful is reduced to a minimum. From the same measurements it would appear that the height of the bars is about that previously used, or 1.75 inches; with two of the largest horses, each weighing over 1,300 pounds, this height was found to be 2.25 inches, and the distance from the proper position of the mouth-piece to lower edge of lip was four inches; for these horses, therefore, the bit would, to come within the limits of the assumed standard, require a length of four and two inches for lower and upper arms respectively.

It is said to be of special importance that the portion of the mouth-piece destined to rest on the tongue and the bars respectively should keep their proper places, and that this can be secured only by making the mouth-piece of precisely the same width as the horse's mouth." It is evident that to comply with this requirement would, for service purposes, be impracticable, but it is as clearly manifest that some effort should be made towards an approximation to this condition. The width of the mouth appears to be very variable and to bear no proportionate relation to other measurements taken; the largest horses did not have the widest mouths, although they

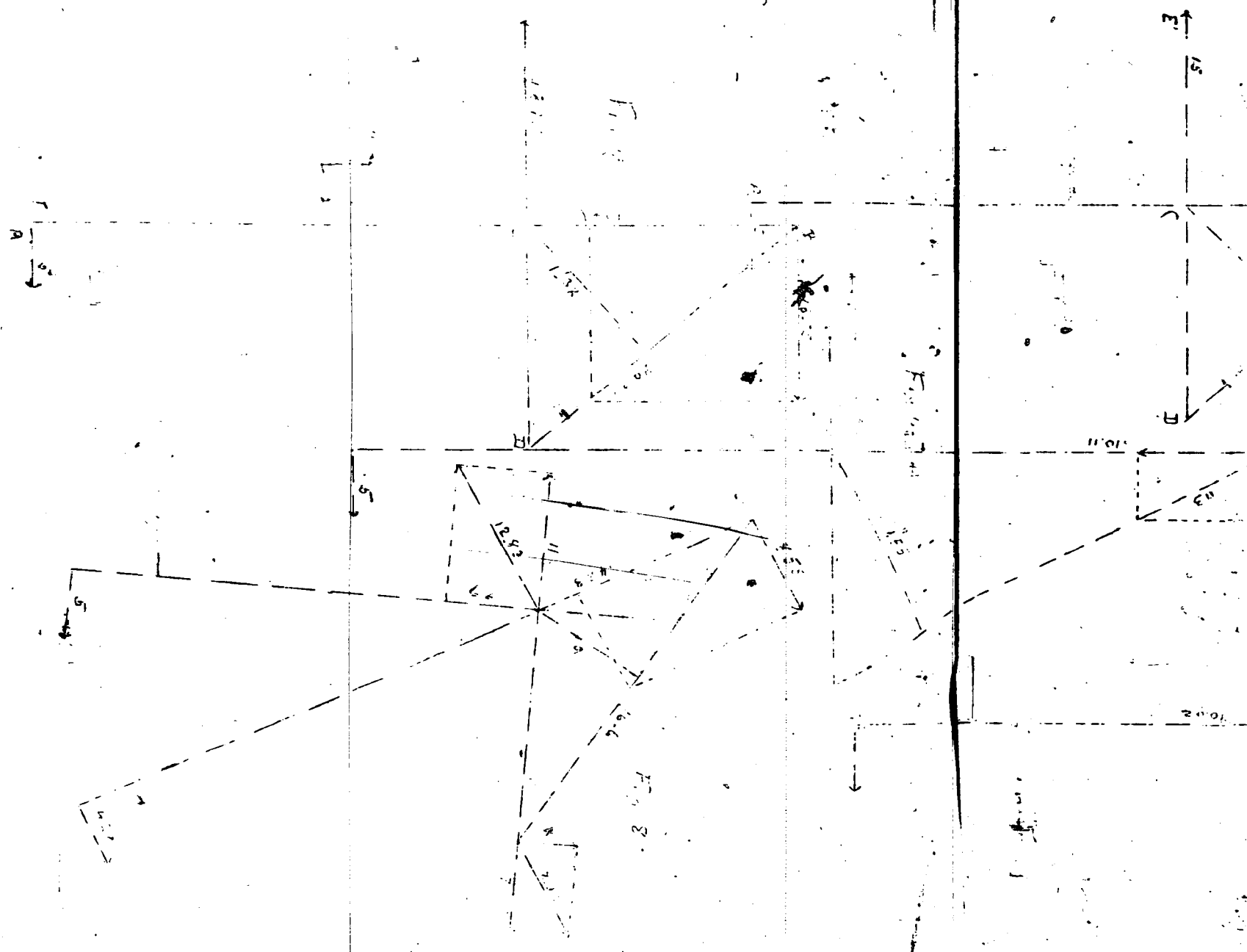
were considerably wider than those of the medium and smaller horses. The greatest dimension noted in this regard was five inches, the smallest 3.75 inches, while others varied between these limits by small gradations. In "Bits and Bitting," the assertion is made that "the width of the tongue-channel is very constantly three-fourths the height of the bars, which gives as a maximum width of port one and one-third inches." This is by no means sustained by measurements taken here; on the contrary, the tongue-channel appears to vary directly with the width of mouth. While a limited experience in this regard will not warrant a positive statement as to the proper width of port, it does, however, suggest that for the widest mouth this dimension should be about two inches, with a proportionate reduction for those of less width.

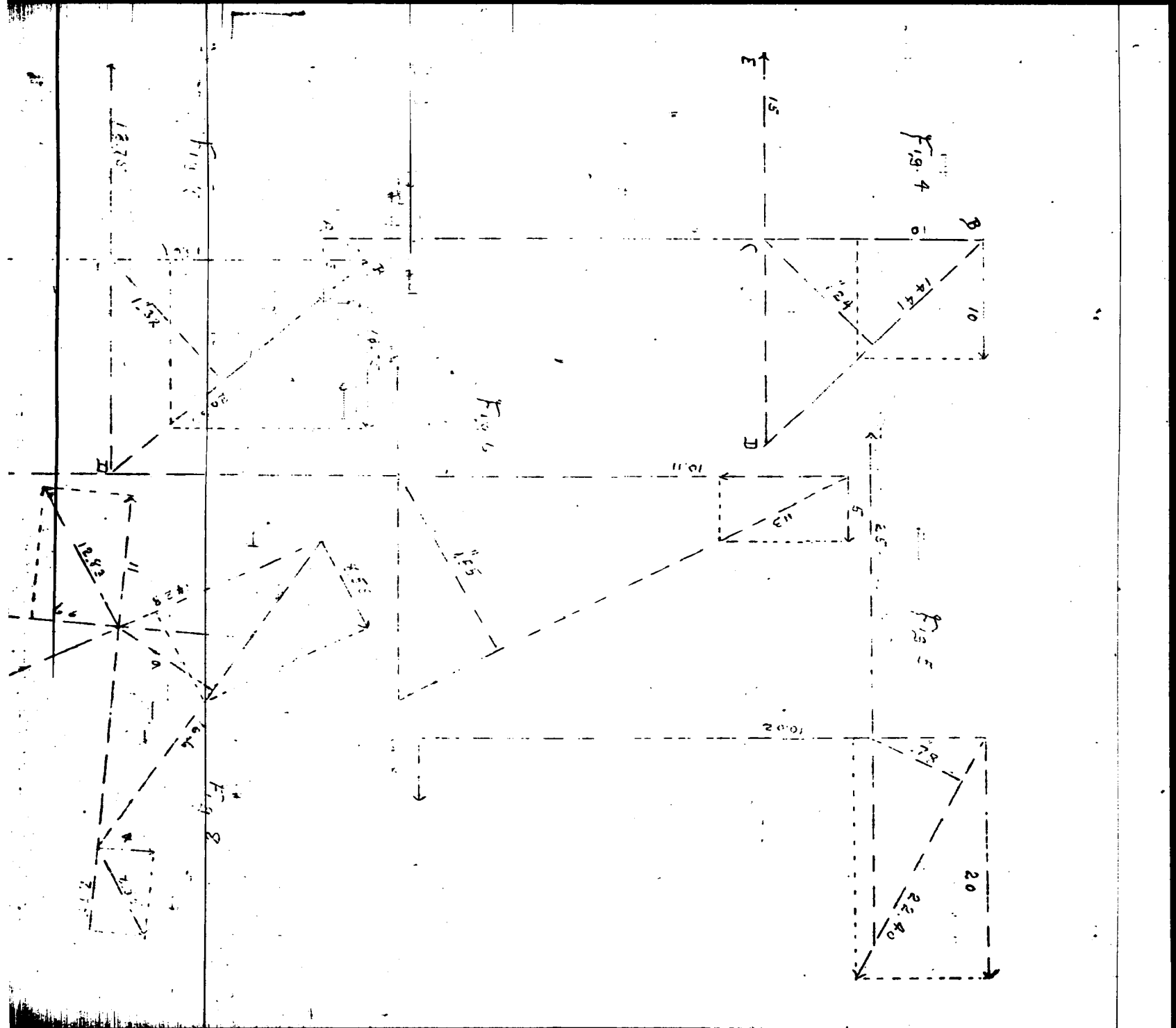
It is at this point proper to note one of the most marvelous statements to be found in equipment literature. Quotation is made from Ordnance Memorandum, No. 29. "The width of arch of mouth-piece is 1.9 inches for all bits. *There are three grades of severity for the bit, determined by the height of the arch of mouth-piece.*" Comment on such an absurdity is a waste of time.

If the premises upon which this discussion rests be correct it would seem that bits should be furnished for service purposes in two sizes as far as the length of the upper and lower arms are concerned, and in at least four widths irrespective of these sizes. The following dimensions are tentatively suggested:

	Sizes.		Width of Mouth-piece.	Width of Port.	Bearing on Bars.
	No. 1.	No. 2.			
Upper Arm	1.4"	2."	A. 3.75"	1.5"	1.12"
Lower Arm.....	3."	4."	B. 4."	1.6"	1.20"
			C. 4.5"	1.8"	1.35"
			D. 5."	2."	1.50"

There is no good reason why this important matter should not receive the same attention as other parts of the equipment issued in sizes to suit the horse.





CONVERSATIONS ON CAVALRY: BY PRINCE KRAFT ZU HOHENLOHE-INGELFINGEN.

TRANSLATED FROM THE GERMAN.

BY FIRST LIEUTENANT CARL REICHMANN, NINTH INFANTRY, U.S. ARMY.

EIGHTH CONVERSATION, (FEBRUARY 21, 1886).—PROGRESS OF THE CAVALRY FROM 1843 TO THE PRESENT TIME.

H. Toward the end of our last conversation we had sufficiently discussed the work on the track and in the circus to be entitled to-day to some exercise in invigorating air.

S. And we had reached the period when WRANGEL broke in among old peace practices like a fresh breeze on stagnant air.

H. Yes; the cavalry exercises near Berlin, which he directed in 1843, ushered in a new era for the German cavalry.

S. In the work which you have cited, KAEHLER gives an excellent condensed review of his activity and work when he was the acknowledged highest authority of the cavalry, although not at its head.

H. It is very interesting to observe how, in the time from 1843 to 1863, WRANGEL's ideas gradually underwent a change. In 1843 he drilled a large body of cavalry, during the first few days, according to dispositions previously made and communicated to the troops; afterward he forbade this practice expressly, and ordered that none but extemporized off-hand exercises be had. In 1843 he had the cavalry regiments retire, in skirmishing order, through the intervals of the advancing columns. Later on this was abolished as impracticable in presence of the enemy, and the echelons in rear now had to attack the wing and flanks. Nor did he at a later date use such deep formations as in 1843, while in 1863 he speaks of drilling in single rank. In his old age, I heard him say with a sigh, that he had survived himself, and considered everything he had formerly instituted as wrong, and that he had become convinced that on account

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of the increased fire effect of the other arms, cavalry could not act except in single rank.

S. It is a proof of WRANGEL's insight and talent that he was still capable of keeping abreast of the time, even in his advanced age, and modifying his ideas in accordance with the latest experiences, as well as improvements in arms. In 1843 there clung to him some of the things, which during the past quarter of a century, he had not seen done differently, nor been allowed to do differently. A practice of twenty-eight years could not well remain without some influence on the actions of a man who suddenly came into a position to develop himself freely.

H. WRANGEL's work is characterized by the cavalry exercises of 1843, next in his essay of 1851, which acquaints the army with his ideas, after he had been deputed to inspect the Prussian cavalry regiments. This gave him the duties of an inspector-general of cavalry without being commissioned as such. Next followed the cavalry exercises of 1853, the new regulations of 1855, and his "Comments," etc., of 1863.

S. In the first cavalry exercises WRANGEL merely practices the employment of masses as a whole, and the forms similar to those proposed by THIELEMAN, BORSTELL, ZIETHEN and BLUECHER shortly after the Wars of Liberation. A proof of WRANGEL's far-sightedness is that already at that time he was preparing the grave for the cumbersome division column in the regulations, and placing more value on dismounted fire action.

H. In 1851 he placed the chief value on the rider spirit. It is also to be noted that here for the first time the individual training of the man is insisted on by the highest cavalry authority. He explains how the inspection is to be made and eschews all evolutions which have not the charge for their end and aim.

S. The ability to pass over long distances at a gallop and the endeavor to gain the enemy's flank, are likewise matters on which he lays stress. In this way he materially promoted the true cavalry spirit.

H. Lastly, we find in the "Comments," the three line tactics laid down for the first time as a fundamental principle, while there is expressed a desire for cavalry corps of from ten to fourteen regiments, and annual exercises of such corps.

S. I do not consider these as his most happy ideas, for it is easy to conceive situations where it is better to charge in two lines than in three, nor have cavalry corps of a strength of fourteen regiments proved a success in war.

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H. In the year 1853 followed the great cavalry exercises with sixty-one squadrons, near Berlin. I took part in them myself. In view of my subordinate position of chief of section among the great mass of artillery, I cannot presume to give a judgment on the exercises as a whole. But I could not free myself then from a feeling of disappointment. From what I had read and heard of the exercises of 1843, I had expected those of 1853 to be brisker and livelier.

S. This would likewise appear from KAEHLER's work. He names as the cause the presence of seventeen landwehr squadrons, whose efficiency, especially in strength and training of horses, was not what is required of cavalry. I also believe that the mass was too large to admit of uniform leading.

H. The most important result of these exercises was the regulations of 1855.

S. They at least regulated the gaits, definitely introduced squadron columns and regulated the charge.

H. KAEHLER calls the cavalry exercises of 1853 and the new cavalry regulations of 1855 the beginning of a new era. I should place this beginning in the year 1843, when WRANGEL's influence began to become more generally felt.

S. The most excellent thing handed down to us by WRANGEL is, in my opinion, his "Comments" of 1863, on the training and use of cavalry. He demands in the first place one common principle and an inspector, to insure its observance. He renews the old principles of FREDERICK THE GREAT, which require the horses to be ridden in the open in winter, thereby assuring the health of the horses. He likewise lays stress on individual riding, and calls to mind the Great King's principle of every day being lost on which the rider does not exercise his horse. As already stated, he forbids the issuing of dispositions before the drill, and wants none but extemporized exercises. Lastly, he wants the inspections to be made unexpectedly. He well knew the evil consequences of regular inspections, with previously fixed limits of the time of training, causing the work, the drilling, to be done solely with a view to the inspection, as I have frequently stated.

H. I consider the manner in which WRANGEL introduced his opinions and ideas as valuable as the ideas themselves. It was this manner that brought life into matters.

S. WRANGEL's singular personality is known to and popular with all.

H. WRANGEL's popularity rests to-day, I regret to say, more in the remembrance of the last ten years of his life in which he had

survived himself, and in which he was conspicuous by his wit and his droll appearance, than in his weight as a military authority.

S. Thoughtful soldiers will never forget his merits.

H. Yet any one in thinking of WRANGEL, has in mind the picture of the droll old man as he was in his ninetieth year, rather than his appearance as a keen cavalry general of sixty years. In those days the small, dry, lean old man, firmly seated without stirrups, as though one with his horse (he invariably rode without stirrups, until in his old age he thereby contracted an injury) came riding up with his sour face, and criticised everything with biting sharpness. Every one of his words was funny, and his criticism all the more pungent. He had absolutely no regard for persons. When he found anything to criticise, it was a matter of utter indifference to him who was concerned. Considerations for former meritorious service, for fathers of families, for age, he knew not. It was said that he had a stone in the place of a heart. If any one appeared to him not active enough on horseback, he expressed his regret at not seeing him again, and urged his removal from active service. He dispensed arrest with great liberality.

S. He did not earn much popularity in those days.

H. Not with the old generals and regimental commanders. They feared and hated him. He removed them. But the young, aspiring generation in the cavalry which had not been sufficiently pedantic to suit these old leaders, and had been prevented by them in the furtherance of smart cavalry service, liked the old WRANGEL all the more, as his severity brought promotion. His wit was amusing and his severity rarely descended on the head of individuals among the young gentlemen.

S. The best means of becoming popular among the young men is certainly to get them promotion.

H. Add to this that WRANGEL was interested in everything connected with smart riding. He was never absent from the races, he rode in the hunts and tormented no one on the riding track with pedantries of form. He indicated the object of cavalry, the state of efficiency it was to endeavor to reach. He met with response from the young generation which went to work and reflected by what means to accomplish this purpose. Without this active and forcible interference on his part, his words, orders, dispositions and writings would have remained dead letters, as likewise all his efforts would have been without lasting result, but for the coöperation of the then young generation.

S. The most lasting effect was, that among this generation he

was training a pupil, who became his immediate successor as the head and highest authority of the cavalry.

H. You mean Prince FREDERICK CHARLES. Before passing to him I would like to speak to you of another appearance in the cavalry world which, at the time when WRANGEL's days of glory were nearing their end, was much talked of, I mean EDELSHEIM's system of individual training.

S. EDELSHEIM brought his ideas forward just at the right time, when WRANGEL emphatically pointed out the importance of good individual training for the efficiency of a mass of cavalry. In those days every one chiefly occupied himself with individual training.

H. Did not EDELSHEIM neglect individual training?

S. What makes you think so?

H. I remember that three officers of the Guard Corps went to Vienna to study EDELSHEIM's system. This bold hussar leader had become the topic in all cavalry circles by his brilliant charges at Magenta and Solferino in the campaign of 1859. What I heard from these officers was to the effect that EDELSHEIM considered our horses overtrained, and that they should be left more nearly in their natural state.

S. Whoever says that of EDELSHEIM, has misunderstood him. EDELSHEIM did, as I do now, recognize that our horses were too much mistrained. He saw that paces were called "Shulterherrein," "Travers" and "Renvers," that were no side paces at all, but a stumbling about in unnatural movements. He abolished such a tormenting of horses. He preferred to gain, and did gain, the balance of the horse by increasing and decreasing the paces on a straight line instead of by ruinous cross-stepping in faulty lessons.

H. So far as I know, he did not care to bend the horse's back by side paces.

S. Because the Hungarian horses furnished a material whose temper and character were not well suited to high training, and inclined to resistance, when much annoyed by "kniebeln" and premature use of spurs; EDELSHEIM knew that well, and very correctly adapted his method of training to the race. He reduced the riding of side paces for the very reason that his work was much more thorough than had been the case heretofore. In this he is in thorough accord with PLINZNER, who considered it wrong to give a horse a more oblique position in and for the side paces than it is capable of by previous training.

H. What do you say to the training of riders on the longe? So far as I know, it has been introduced throughout the Austrian army.

S. This training of the recruit on the longe may prove to you how thoroughly EDELSHEIM wants individual training carried out; it indicates that he knew the high school well. As the scholar of the high school had to learn between the pillars and without reins how to sit on the school horse, which moved at the motion of the instructor's whip, so EDELSHEIM puts the recruit on the horse which is led by the longe, without reins, and arms crossed behind the back. In this way he prevents the rider from giving the horse a chuck in the mouth every time he becomes unsteady in his seat.

H. It is true that the poor recruit horses suffer much rude, though involuntary, pulling of the reins when the recruit fears he is falling off.

S. So much, that if the poor beast is not already a chunk of wood, devoid of feeling, it soon will be; furthermore, EDELSHEIM does not put the reins in the hands of the recruit until he has become firm on the horse on the longe with hands behind the back, until his seat is firm. You see, he works very thoroughly, very systematically; he gains thereby much for the further training of the rider, for when the recruit does not get the reins in his hands until his seat is firm, it never occurs to him afterward to hang on by the reins to keep his seat, while it costs much time to break the recruit of this bad habit when once acquired, because he had to handle the reins the very first day.

H. I wonder where EDELSHEIM gets the instructors and the time to carry out this instruction.

S. Of course there are not enough non-commissioned officers for instructors, and men must be used who are serving in their second and third year. But the time is easily made up, for a recruit who is not instructed in the handling of the reins until he can sit by himself, correctly and firmly, learns much quicker how to handle the reins well and properly. I wish to refer you here to one of BAUCHER's principles: "*Plus vous allez lent, plus vous irez vite.*"

H. You seem to advocate that we should likewise teach the recruit the seat with the use of the longe, and without reins, before putting the reins in his hand.

S. I should not object if this method were introduced; I realize, however, that it would be difficult to get such a radical change in the system of training adopted; moreover, a rational use of whip and longe is likewise difficult, and the chief difficulty would be that we have not enough men who understand it. We have other means, however, to turn, at the beginning, the recruit's attention to the

seat alone, and for this reason I do not place such weight on the introduction of this method of training recruits.

H. I reserve to myself the privilege of questioning you thoroughly on this subject later on; let us now return to the thread of our conversation and discuss the further development of the cavalry under the influence of Prince FREDERICK CHARLES.

S. This eminent Prince united in himself many qualities which enabled him to exercise the most favorable influence on the further development of the arm. His military passion, his restless activity, his high personal position in the reigning family, and his rich experience gathered in the course of promotion in peace time as well as in the field before the enemy, could not but make him the proper man for improving the army, even had he been devoid of natural gift.

H. You have failed to mention a certain smartness and eagerness which in a true horseman must never be lacking and which were in his blood; when quite young this eagerness caused him in the Baden campaign in 1849 to throw himself upon the enemy far in advance of the charging squadron, where he was wounded and some of his suite killed and some wounded.

S. That charge was much talked about at the time.

H. Much and severe criticism was pronounced; he was blamed for being the cause of the death of some officers, which it was said he had caused by his youthful ardor. It was chiefly from those discreet old men who wanted cool deliberation alone, and were opposed to bold daring on his part.

S. It was asserted at the time that he had drawn the squadron into a senseless charge.

H. His opponents said so, but it was not the case; the squadron meant to pursue the retiring enemy; the Prince asked permission to take part in the charge, for he had no command in that campaign. He placed himself at the head and charged on the enemy; the squadron followed, but could not ride as fast as the better mounted officers, who remained with the Prince; thus he and the officers together received the volley. The squadron of not more than 100 riders following in rear made 250 prisoners. Is that a senseless charge? Fortunately the King, informed of the actual facts, rewarded the Prince, who had been wounded by two bullets, and thus did not smother his incipient ardor, as the fault-finders would have been glad to do.

S. It is of the greatest importance that independence and boldness in the cavalry be ever encouraged by praise, though it may afterward be sometimes discovered that too great a risk had been taken.

H. Initiative and boldness are always better than a too long waiting for orders and the missing of a favorable opportunity.

S. In 1863 we find him again as commanding general and successor of WRÄNGEL in the command of the Third Army Corps, after having previously commanded a squadron, a regiment, a brigade and a division. At the cavalry exercises under WRÄNGEL, in 1853, he was already in command of a brigade.

H. It is hard to define what improvements of the arm are to be ascribed to him personally, though we all still have in mind how continuously and indefatigably he worked, for there exist but few writings by him.

S. We find enough in the instructions and orders he gave, and which we read in KÄHLER's book. There you find—and it suffices for us—and supports the ideas I have formed—the following: He laid the greatest stress on individual training; he would not have the echelons in rear charge except on the flanks and in a slanting direction; he deprecated all formalism, and held every leader responsible for choosing such a formation and method as to reach his aim with the least expenditure of time and energy; he strove for simplicity of the evolutions; he made the independent riding of the individual man the chief object of the training; he did not rest contented with a good drill on the level drill ground, but demanded equal precision in the evolutions on the terrain. In the instructions for his corps, in 1861, he wants the drill made sharp and short; he demands that the horses be exercised even on days of rest, and thus renews the principles of FREDERICK THE GREAT. New for that time, was the requirement to drill in single rank, to charge with the squadron inverted, to develop the full speed and to regulate by order the heretofore forbidden English trot, when trotting at ease under the name of "easy trot." In the regulations issued by him he likewise was ahead of his time, and made the platoon column the one chiefly used, which the regulations of fourteen years later introduced for squadron and regimental columns. Lastly, he considered it necessary to bring to mind the importance of the closeness of the charge, and to emphasize it again and again.

H. These decisions of the Prince belong to a time when he was not as yet at the head of the cavalry as its inspector-general, to which position he was not called until after the War of 1866 had demonstrated that the cavalry did not have that share in the success which had been expected. After this time it is impossible to ascertain what measures are to be ascribed to his activity. KÄHLER himself, a great admirer of the Prince, says that his appointment as inspec-

tor-general did not quite fulfill the hopes entertained by the cavalry branch of the service.

S. Considering the position of the Prince within the royal family, it is natural that as yet it cannot be ascertained what improvements are to be attributed to him and what to other, still living, influential persons. Any way, it cannot but be assumed that he took a due share in everything that was done. In the War of 1870 KÄHLER says one of the first things he did was to push the cavalry under his orders on the enemy with orders to stay there. In this way he initiated that role of our cavalry of which you spoke with so much praise in your letters on cavalry in the campaign of 1870. Furthermore it is not possible that in his inspections the Prince should have exerted any influence on the cavalry as a whole other than in the sense of the instructions of 1861 and 1863, drawn up by him for his corps. The essential changes in the cavalry, the work of the STOLLBERG cavalry commission, the project of regulations of 1873, the regulations of 1875, must have been suggested by him.

H. The cavalryman most frequently mentioned in and after the War of 1870 is General von SCHMIDT.

S. And how much did the Prince do to make General von SCHMIDT's ideas prevail. It was chiefly due to the Prince's efforts that his collected instructions were printed on account of their high value, as expressly stated in the introduction.

H. SCHMIDT certainly was one of the most prominent cavalrymen of the last few decades.

S. His energy in war and his capacity for leading large bodies of cavalry cannot be denied.

H. Yet he had many opponents.

S. They belonged in great part to the remnants of those adherents of the principles prevailing from 1815 to 1845, who would like to make riding in the square and in the circle the end and aim of all cavalry work.

H. He was found fault with for ruining too many horses.

S. It is true, SCHMIDT makes some demands in this direction which, in my opinion, go too far, for SCHMIDT was more a drill master of masses of cavalry than a moulder of the individual, especially the horse. The damage done, however, is more due to his admirers and all those who misunderstood him, than to himself.

H. On the occasion of his death, I heard one of our most influential officers make the remark that the death of this brilliant leader had perhaps saved the lives of several thousand horses.

S. That is not impossible, for every great master has pupils who

imagine that they can surpass him by going farther in his direction than he does. As SCHMIDT, in his demands, approached the limits of the possible, any step beyond must do harm.

H. The improvements made in the cavalry after the war can be epitomized under the following heads: 1. Care in the training in reconnaissance service, by the instruction of officers, as well as by rendering the horses capable of long continued rapid movement; 2. Definite, but elastic rules for the leading of large bodies; 3. Greater mobility of the masses by the introduction of the squadron column, regimental column, dressing toward the center in platoon and squadron, removal of the term inversion and of all evolutions which have no tactical, warlike purpose; 4. Importance attached to individual training and individual riding; 5. Armament of the cavalry with a long range fire-arm and thorough instruction of every horseman in firing.

S. It is not to be denied, that the work was carried on incessantly and with much insight.

H. Since you acknowledge that, I am curious to hear, in detail, the objections you have to make to the encomiums I have bestowed on the cavalry. It would be preferable, if you would communicate to me the system which you would use for the training of the troops.

S. It never occurred to me to introduce a new system—to become a reformer. The improvements which I desire I have already touched upon. If you wish to hear them recapitulated and substantiated, you must ask me questions of detail.

H. Good! I shall try to arrange my questions systematically and begin to plague you with them the next time.

CAVALRY EXTENDED ORDER FORMATIONS.

BY CAPTAIN JAMES PARKER, FOURTH CAVALRY, U. S. ARMY.

IN prescribing a system of extended order for cavalry we are confronted at the outset with the fact that such a system finds its principal and almost only use, dismounted. This fact is as clearly indicated by experience as by the plain conditions under which cavalry must always fight. It is not necessary to cite history to show that cavalry cannot fight effectively with the carbine, mounted; nor is it of advantage to go into a long discussion to show how a horseman on a skirmish line affords to the hostile rifleman an easy mark, and possess little power of retaliation.

These facts are plainly enough admitted in the regulations themselves, where, on page 367, the following brief and restricted rôle is assigned to mounted skirmishers: "They are principally used to clear and beat up wooded localities, in conveying supply trains, and in partisan or Indian warfare." The regulations might well have added: "Mounted skirmishers should never be used when it is desired to kill or wound the enemy."

A system of skirmishing should be modeled on the needs, not of a mounted, but of a dismounted force, since it then finds its principal use. Our regulations should speak with no uncertain sound on this point.

During the War of 1861-5 our leaders discovered what was then a new rôle for cavalry and which has added enormously to the value of that arm. What they discovered and developed let us not lose sight of. Some people dub, contemptuously, cavalry trained to fight on foot, "mounted infantry," but it requires merely an absence of overruling prejudice and a little common sense, to be convinced that a force which can fight effectively on foot as well as on horseback has gained enormously in value as a weapon of offense. Cavalry which can fight on foot can be independent, self-reliant, though not

less swift. As an advance guard, a rear guard, a flanking force, a raiding force, cavalry must hereafter be prepared; mounted, to meet cavalry with the saber; and dismounted, with the rifle to capture and hold positions, to resist infantry and to attack infantry.

To state the principle again, skirmish action is a method of fighting dismounted, which finds a very rare and somewhat doubtful application mounted. It is evident, then, that a system of skirmishing should be based upon the needs of dismounted troops, not on the needs of the horse and rider. The size and composition of the fire unit, the method of deployment, must be arranged with reference to dismounted, not mounted fighting.

Again, for obvious reasons, *simplicity* is a paramount necessity in all systems of tactics. But especially is it for a drill book, which is intended to embody a course of training for the hastily raised volunteer forces of the United States. Wars are entered upon quickly in these days, and when our time comes we shall have no time to lose in studying intricacies. We must have a drill book that is simple and easy.

It must be admitted that in these respects there is much to criticize in the drill regulations of 1892. The system is a system of mounted skirmishing made adaptable to dismounted skirmishing, when occasion shall arise. Intricacies of deployment, which are unnecessary even when mounted, are retained in dismounted action, destroying simplicity of command and execution, and vastly increasing the perplexities of squadron, troop and group commanders. Take a troop in line, for instance, we find in the drill book a method of deploying to the front, and also a method of deploying to the flank, the latter being simply a restricted deployment to the front. Here are two methods when one would be sufficient. The troops in column of fours also may deploy to the front or by the flank. The deployment in these cases may be by individual skirmishers, or else by squads, the squads afterwards deploying by skirmishers. The first of these was not needed. The chief of each squad may (and he is in certain cases allowed considerable discretion) deploy his squad into line of skirmishers by the following different commands: Being in line: "*As skirmishers, right (or left) front into line, MARCH.*" (Note the clumsiness and paradoxical nature of this command.) "*As skirmishers, right and left into line, MARCH.*" "*As skirmishers, fours right (or left), trot, MARCH.*" From column: "*As skirmishers, right (or left) front into line, MARCH.*" "*As skirmishers, to the right (or left), MARCH.*" Here are nine different ways in which a squad may be deployed. In some of these the base file halts; in some he moves

at a walk, and in still others he is required to move at a trot. In some of these deployments, the deployment is made at a gallop, no command being given for the gallop; in another, at a trot, the command, "trot," being obligatory; in still another, at a walk. The troop may deploy on its right squad, its left squad, or the right or left squad of any interior platoon. Intricacy and obscurity are combined in these drill regulations. A captain of cavalry, who is ordered to place his troop mounted in skirmish line at a certain point, facing in a certain direction, has his choice of fifty-four different methods, without taking into account the question of gait.

If we consider the means of deploying a mounted troop to fight dismounted as skirmishers, we discover at once new intricacies. The troop from columns may dismount to fight on foot to the right front and to the left front, to the right and to the left. On dismounting it may assemble in fours, or it may assemble in squads, or it may assemble as a troop. Having determined his choice of these preliminaries, the captain has still to choose from the fifty-four methods of deployment. Or, the captain may deploy the troop mounted into line of squads, dismount the men, and bring back the horses. In truth, it may be said, the captain of a troop has a wide discretion. He may select any one of four hundred odd methods of forming his men, their faces to the foe. It is not to be supposed, however, that his troubles end here. Having determined upon his command, he has still to deliver it, which is never done without considerable exertion on his part. To explain this, let us instance one of the commands of a captain desiring to dismount his men, form line of squads and deploy as skirmishers: "*To fight on foot, action right front, assemble on first squad, first platoon, MARCH. At so many yards, line of squads, on right squad, second platoon, fours right and left, MARCH. Troop, HALT. Squads as skirmishers, right and left front into line, double time, MARCH. Skirmishers, HALT.*" This command contains just forty-seven words. It is true that the captain, by using greater judgment in his selection of one of the four hundred methods of accomplishing his purpose, might have obtained a shorter command, and thus abridged his long-winded discourse. But what are we to say of a drill book which makes such things possible, when bullets are whistling?

It is patent to every one that there is no necessity for all this. The same Board of Officers that ostensibly prepared the Cavalry Drill Regulations, also prepared a drill book for infantry, which contains a system of extended order drill, which, in command and execution, is as simple as our system is complicated. There was no

good reason why our skirmishing tactics (which are primarily intended for dismounted fighting) should not have been essentially the same as the extended order for infantry, but it would seem that the only assimilation that has been practiced is the incorporation into the cavalry of the infantry *squad*, a subdivision which I intend to show is not adapted to the uses of mounted troops.

The *squad* as a subdivision of a company for purposes of administration, has long been known to our army. By the provisions of Paragraph 259, Army Regulations, each troop is divided into four *squads*, according to height. The men of each *squad* are in charge of a non-commissioned officer night and day, who sees that they are orderly and clean. They are quartered together, and fall into ranks together. All this is changed. We are now told that when in rank the Army Regulations become void since the Drill Regulations came into play. These last require, in case the troop contains four platoons, that each *squad* now become a platoon, shall be divided into two drill *squads*. The right drill *squad* of the first administrative *squad* becomes, in the language of the drill book, the "right *squad*, first platoon." This is, to say the least, rather confusing to the enlisted man. Again, each platoon, the drill book says, shall consist of not less than four, nor more than six sets of fours, and each platoon is to be divided into two *squads*. The normal formation of the troop apparently is to be of four platoons, of six sets of fours apiece, making, with trumpeters, guides and chiefs of platoon, three officers and 103 men.

It is difficult to discover why the requirement is made that the platoon should consist of not less than four sets of fours, except for the reason that this drill-squad system made it necessary. It was plainly impracticable to divide a platoon of three sets of fours into two serviceable *squads*, so the compiler adopted the provision that the platoon shall not have less than four sets of fours. It is apparent to every cavalry officer that this is a blow to the maneuvering facility of the troop. The customary platoon of three or four sets of fours is a most useful subdivision, handy, manageable, able to traverse uneven ground almost as easily as a set of fours, and a good formation to use in marching on streets and roads. The larger the platoon becomes, the more unwieldy it becomes, and consequently the fewer opportunities occur for its use; marching by platoons in streets becomes impracticable. The new turn, a movement which might be called "breaking ranks to get around a corner," though objectionable, does well enough when the platoon contains but three or four sets of fours, but when attempted by a small troop or a pla-

toon of five or six sets of fours, especially at increased gaits, there is presented a scene of confusion, hardly to be reconciled in the mind of the ordinary spectator with military precision. Again, the requirement that platoons shall consist of not less than four sets of fours, is not applicable to our small troops in peace time. The strength of a troop at drill in the ordinary post is usually six or seven sets of fours, and as a necessity, the requirement is usually disregarded.

But even the purpose intended to be secured by this provision, namely, that the platoon shall furnish two groups or *squads* of proper strength, is not secured. In "BACHELOR'S Infantry Fire," a work of great merit, endorsed by the War Department, we are told that "these groups should be large enough to prevent the control of the fire from falling into the hands of inexperienced leaders, and small enough to bring each man directly under the eye of his leader. Under a close fire, one man cannot look after more than sixteen at most, and smaller groups than eight men would split up the command too much; hence these may be considered the maximum and minimum, respectively."

Going back to our new drill regulations, we find that our largest platoon of six sets of fours furnishes for dismounted firing two *squads* of eight men and a *squad* leader each; and that the smallest platoon of four sets of fours furnishes two *squads* of five men and a leader. In the first case, the groups are of the minimum strength, according to BACHELOR; in the second, of less than the minimum. This is not all; the normal troop of four platoons or eight *squads* numbering from 71 to 103 men, would require thirteen non-commissioned officers, i. e., eight for the *squad* leaders, three for guides, and two for chiefs of platoon. Granting that two of the guides are available for *squad* leaders, it does not alter the fact that, with the present organization of our troops, we have not enough non-commissioned officers to furnish one to take charge of the led horses, two to command platoons, and eight to command *squads*, leaving out the question of supplying vacancies caused by casualties. Not the least of the faults of the *squad* system, as applied to the cavalry then, is its impracticability under present conditions.

What is, then, to be our fire unit? An answer, which easily disposes of all these difficulties, will occur readily to the cavalry officer who has considered the subject. Let our fire unit be the *platoon*. Let the minimum platoon be one of three sets of fours, furnishing a leader and nine men for dismounted work; the maximum, one of five sets of fours, furnishing fifteen men and a leader. The average

platoon will then be of four sets of fours, furnishing a group of twelve men, for fighting on foot. The number of platoons need not then be limited to four. Our group leaders will then be appointed according to rank; not inversely, commencing with the junior corporal, as seems to be the case in our drill regulations. Our groups will, also, as a rule, include an extra non-commissioned officer—one available for command in case the leader is disabled. One lieutenant would naturally have command of the firing line, and the other of the support. But, in case (through the depletion of the troop or other causes) either echelon consists of but a single platoon, the lieutenant with it would act as group leader.

The platoon then should be the cavalry fire unit. But, in addition, to insure simplicity and the idea of leadership, the platoon should be, in the words of our drill book, "the basis of extended order." The integrity of the group should be maintained, not (as in the drill book) only *after* the deployment, but *during* the deployment. In forming a skirmish line, the platoon should be led to opposite its position, and then deployed. There should be no departure from this rule. No possible advantage in time or facility of maneuver is gained by deploying the troop as one group. Two ways of doing the thing should not be adopted when one is enough.

Another reason for simplicity: The commands of the captain and of the major must be given by signal—by trumpet or otherwise. The captain may be 200 yards in rear of the line of groups, the major still further. At that distance the voice is drowned. Even at close distances the noise of musketry makes the use of the trumpet or other signal imperative. All commands, therefore, in extended order, should be capable of rendition by the trumpet. This consideration alone obliges us, in compiling a drill book, to adhere to a few simple movements which are capable of being ordered by signal.

Instead, then, of two systems of deployment, one by the flank and one to the front, let there be substituted one only, the line of squads or of skirmishers to be formed thirty yards in front of the troop. The formation of a line of skirmishers to be as follows: The troop being in line, the captain commands or signals, "*As skirmishers, guide left (right or center), MARCH.*" The chief of the left platoon commands, *As skirmishers, guide left.* The chiefs of the other platoons command, *Fours right.* At the command, *MARCH*, repeated by the chiefs, the left platoon deploys. The left trooper marches at a walk straight to the front; the other troopers oblique to the right at the walk, each taking the direction and gait of the left trooper when at his interval from the trooper on

his left and when on the alignment. The left platoon advances thirty yards, when the chief commands, *Platoon, HALT.* The other platoons move in column of fours to the right, and when the rear of each platoon is opposite its place on the deployed line, the chief commands, *Fours left, MARCH.* *As skirmishers, guide left, MARCH.* The left skirmisher of each platoon moves in such a direction as to leave his interval from the right skirmisher of the preceding platoon on reaching the line.

If the command of the captain be *Guide center*, the center platoon and the platoons to the right of the center deploy as just explained. The platoons to the left of the center wheel by fours to the left, and on arriving opposite their places in line, wheel by fours to the right and deploy on their right skirmishers.

If the command of the captain be *Trot*, the base platoon deploys as just explained, the base trooper moving at a walk, the other troopers of the base platoon deploying at the gait indicated. The other platoons are conducted at a trot to opposite their places in line, and there deployed in the same manner as explained for the base troop. Deployments will be made at a walk or trot, never at a gallop.

Skirmishers always deploy at the gait indicated, the base trooper moving at a walk, whatever the previous gait. *This rule is general.*

In extended order deployments, the command, *Guide left (right or center)*, designates the direction of the base, and should always be given before the command, *MARCH.* *This rule is general.*

In all deployments, whatever the gait, the base platoon is halted by its chief after advancing thirty yards, or on a line previously designated by the captain. If it is afterwards desired to move the deployed line forward, before it is formed entirely, the captain will command, *Forward, MARCH.* The platoons in rear of the line, as soon as they are deployed, will then be conducted by the chiefs, at an increased gait, to their positions on the deployed line. The captain may also halt the base platoon before advancing thirty yards. *This rule is general.*

Being in line to form line of platoons, the captain commands: *Line of platoons, guide left (right or center), MARCH.* Executed at a walk, the platoons gaining deploying distance on the base platoon and halting on the line faced to the front. The principles of paragraph 8 apply.

Being in line of platoons to form line of skirmishers, the captain commands: *As skirmishers, guide right (or left), MARCH.* The chiefs repeat the commands. The platoons deploy on the right skirmisher. Each platoon is halted when it has advanced thirty yards.

Being in column of fours to form line of platoons to the front: *Line of platoons, guide right, MARCH.* The chief of the first platoon commands, *Left front into line, TROT.* The chiefs of the other platoons command, *Column half left.* At the command, *MARCH,* repeated by the chiefs, the first platoon forms line and is conducted forward thirty yards and halted. Each of the other platoons is conducted to a point opposite its place in line and thirty yards from the line, changes direction half right, executes left front into line, trot, march, and is halted on the line.

Troop in column of fours to deploy as skirmishers to the front: *As skirmishers, guide right (or left), MARCH.* The chief of the first platoon repeats the command. The other chiefs command, *Column half left, MARCH.* The first platoon deploys, as explained for the deployment from line. The other platoons are conducted opposite to their places and deployed in the same manner. The troop in column of fours forms line of platoons or skirmishers to the right by wheeling by fours to the right, and afterwards deploying as from line.

To assemble (from line of skirmishers): *Assemble, guide right (left or center), MARCH.* Each chief of platoon commands, *Assemble, guide right (or left), MARCH,* the command being *Guide right (or left),* according as the platoon is to the left or right of the base trooper of the troop. Each platoon assembles on its base trooper and is then conducted in column of fours to its place in line.

Squadron in line to form line of platoons: *Line of platoons, guide right (left or center), MARCH.* The base troop forms line of platoons. Each of the other troops is marched in column of fours opposite to its place in line, wheeled into line and deployed into line of platoons from the base platoon.

Line of skirmishers is formed in a similar manner, the command of the major being, *As skirmishers, guide right (left or center), MARCH.*

Squadron in column of fours to form line of platoons to the front: *Line of platoons, guide right (or left), MARCH.* Captain of first troop commands, *Line of platoons, guide right, MARCH.* The captains of other troops command: *Column half left, MARCH. Column half right, MARCH. Line of platoons, guide right, MARCH.*

Line of skirmishers is formed in a similar manner, the major commanding: *As skirmishers, guide right (or left), MARCH.*

To dismount to form on foot: The troop being in column of fours, the captain takes post on either flank and commands: 1. *Form on foot,* 2. *DISMOUNT.* At the second command, Nos. 1, 2 and 3 of each four dismount, link horses, and move out of the column on the side toward the captain. Each platoon then closes up in column of

fours on its leading four, the leading four facing to the front, the inner man being one yard from the horses of that four. The chief of platoon, dismounted, takes his post, as in column of fours, on the side towards the captain.

To deploy to the front, the captain commands: *As skirmishers (or line of platoons), guide right (or left), MARCH.*

To deploy to the right (or left): *Fours right (or left), MARCH. As skirmishers (or line of platoons), guide right (left or center), MARCH.*

To assemble in front of the horses: *Assemble, guide right (or left), MARCH.* The first platoon, at the command of its chief, is formed left front into line, on a line five yards in front of the horses. Each of the other platoons is conducted in column of fours to its place in line, and when near the line, is formed left front into line in prolongation of the line of the first platoon.

To assemble to the right (or left): *Fours right, MARCH. Troop, HALT. Assemble, guide right (left or center), MARCH.* The base platoon is moved forward five yards and halted. The other platoons are wheeled by fours toward the base platoon and formed in line on its left (or right).

THE SQUADRON.

When the squadron is dismounted to form on foot, the captains place themselves on the flank toward the major.

Being in column of fours to dismount and deploy to the front, or to the right (or left), the movement is executed by the same commands and like means as in the case of a troop.

The squadron being in line of troops in columns of fours, to deploy to the front: *Form on foot, DISMOUNT. Troops assemble, guide right (or left), MARCH. As skirmishers (or line of platoons), guide right (left or center), MARCH.* The troops are assembled in front of the horses and there deployed.

It often happens that the command "to fight on foot" is inapplicable; the expression, "Form on foot," has therefore been substituted. Occasions often arise when it is necessary to dismount, leaving the horse holders mounted, in order to clear away obstacles, mend roads, extricate wagons, etc. To dismount a funeral escort in order to fire a salute by the command "to fight on foot," is ridiculous. This command implies immediate hostilities, and occasions might arise when fighting should be avoided, and when it would be inconvenient and dangerous to peace to use this form of command. "Form on foot" has not this objection.

It will be noticed that all the commands laid down can be sounded on the trumpet except one. This exception is the command, "Form

on foot, DISMOUNT." It is suggested that the signal to be found in the artillery drill regulations, of "*Cannoneers, prepare to dismount, DISMOUNT,*" would be suitable for this command.

The above is a rough sketch of a system of deployment. The following advantages are claimed for this system:

Greater simplicity of command.

Greater simplicity of execution.

The size of the fire unit more closely corresponds to the most suitable size, as fixed upon by writers on the Art of War.

The fire unit is a more convenient division of a cavalry troop.

Freedom from the confusing distinction between the administrative squad and the drill squad.

Group leading is made the rule during, as well as after the deployment, thus better maintaining the integrity of the group, and the authority of the group leaders.

The confiding of the command of groups to the most experienced instead of the most inexperienced leaders.

The extension of the use of the trumpet or other signal to all commands for deployment.

In considering this subject we must not fail to keep in mind that the training comprised under the caption "Extended Order" in our drill book is not only of a most important nature, since it fits the soldier for battle, but also is most extensive, including a mass of subjects to make the soldier familiar with which requires long and patient training. Fire discipline, instruction on varied ground, use of cover, and battle exercises, are some of the subjects included in extended order, and in comparison with which the question of deployment is of small account.

We, of the cavalry, are already greatly weighed down by the immense variety and extent of the training necessary to make our short service men even fair soldiers, as that term is understood in modern warfare. Hence, we cannot afford to spend valuable time teaching complicated methods of forming a line of groups, or of skirmishers, many of which would be of doubtful utility on the battlefield. Precise and varied maneuvers are a great help to discipline, but the place for teaching that sort of thing is at close order drill.

Let it be understood, then, that the training of the cavalry soldier to fight dismounted is of vast importance; that the method of deployment is of little consequence, provided it is simple, easily learned, and effective. Such a method we do not possess, and should adopt.

THE NEW MODEL MAGAZINE RIFLE, CAL. 30.

[The following description of the new magazine rifle, adopted for use in the U. S. Army, which is practically, as regards its mechanism, the same as the carbine to be made for the cavalry, is that prepared for the use of the cadets at the Military Academy at West Point, and has been furnished to the JOURNAL through the courtesy of Lieutenant JOHN M. CARSON, Jr., Fifth Cavalry, Adjutant of the Academy. The plates were made from drawings by Captain STANISLAW E. BLUNT, Ordnance Department, U. S. Army. — EDITOR OF JOURNAL.]

THIS gun was adopted for the U. S. Service in 1892, and is now being manufactured for issue. It is called also the Krag-Jorgensen, from its inventors, and resembles in many respects the Danish small arm, but has many improvements not found in the latter.

GENERAL FEATURES.

In its general features it is a bolt gun with fixed magazine, and cut-off so arranged that the piece can be used ordinarily and readily as a single loader, and the magazine can be brought into use at any moment. The magazine can be loaded with the breech closed or open, and the cartridges can be placed in singly or all at once. The magazine carries five cartridges.

DESCRIPTION.

Breech Mechanism.—Bolt.—The bolt *d* Figure 6, is a cylinder of steel bored out axially to receive the firing pin and main spring (*c* and *e* Figure 2). On its exterior are three projections, the locking lug *k*, which fits in a corresponding groove in the front of the receiver, the guide rib *r*, and the handle *h* for operating the bolt. A groove on the under side forms a path for the rear of the ejector. A triangular slot is cut in the rear of the bolt under the handle.

One of the sides of the notch thus formed is inclined to the axis of the bolt and forms a bearing for a similarly inclined surface on the cocking piece *m*—Figure 11.

Firing Pin.—This consists of two parts, the striker Figure 8, and the pin proper Figure 7.

Cocking Piece.—On the rear of the firing pin is screwed the cock-

ing piece Figure 11. The forward end of this is cut away at an angle, making an inclined surface *m* which bears against the inclined notch in rear end of bolt. *n* is the cocking notch.

Sleeve.—The firing pin and bolt are connected by means of the sleeve Figure 12. This sleeve, though a single piece, may be considered as composed of two parts.

1st, *e*, which projects over the top of the rear of the bolt and to which is attached the extractor in the notch *a*.

2d, *d*, a hollow cylinder which enters the hollow in the rear of that bolt and through which the firing pin passes. In the recess *w* works the collar *b* Figure 6, which connects the bolt and sleeve and permits the rotation of the bolt without rotating the sleeve.

If the bolt be rotated far enough, which may be done when it is out of the receiver, the sleeve may be removed.

Safety Lock.—Lying in the top piece of the sleeve *e* Figure 12, is the safety lock Figure 13. It consists of a short rod *a* with a thumb-piece *d*. The end *a* if cylindrical would always project into the cavity *w* Figure 12; it is therefore half cut away. When the latch is turned to the right, the part not cut away projects into the cavity *w* and enters a notch in the rear end of the bolt (*a* Figure 6), and prevents rotation of the bolt. The thumb-piece is slightly cut out on left side (in Figure 13), to allow the passage of the cocking piece Figure 11. When the thumb-piece is turned the solid portion comes in front of the cocking piece and prevents its forward motion, and hence the piece cannot be fired.

Mainspring.—This is a spiral spring surrounding the firing pin and bearing in front against the striker at *v* Figure 1, and in rear against the forward shoulder of the sleeve.

Extractor, Figure 14.—This is a long spring of steel attached to the front end of the sleeve at *o* Figure 1. It has a projection on its under side, which bearing against the shoulder *s* of the guide rib *r* Figure 6, prevents rotation of the bolt. When the bolt is withdrawn, it can be released from the shoulder *s*, the bolt may then be further rotated to the left and entirely withdrawn from the receiver.

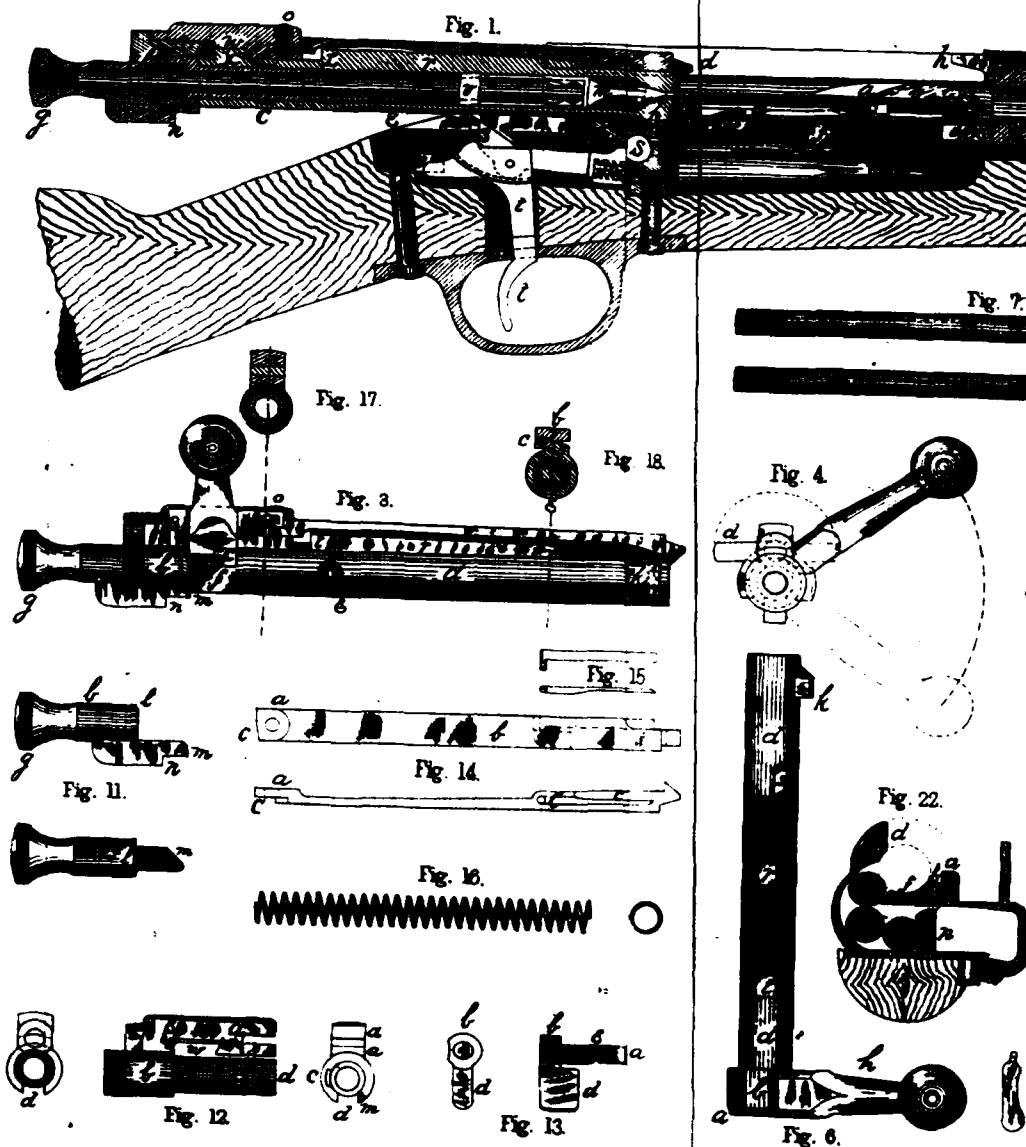
Ejector.—This is a double lever *p q* in Figure 1, pivoted at *v*. The arm *p* ordinarily lies in the groove in the bottom of the bolt.

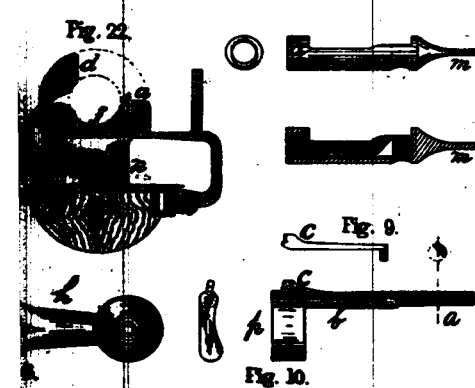
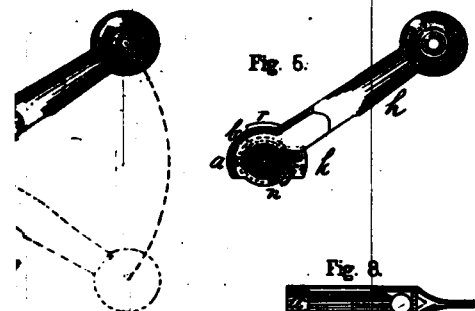
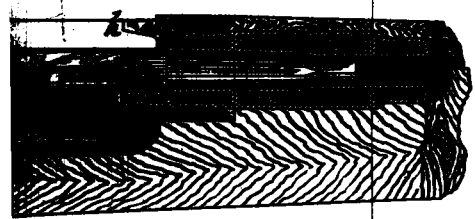
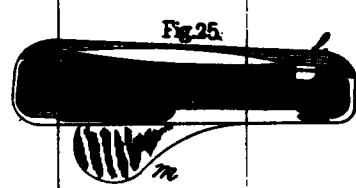
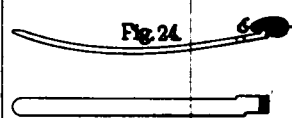
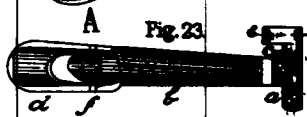
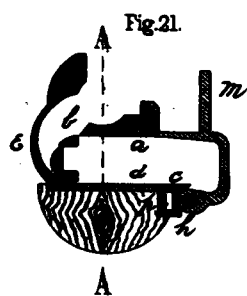
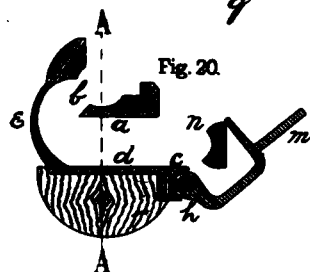
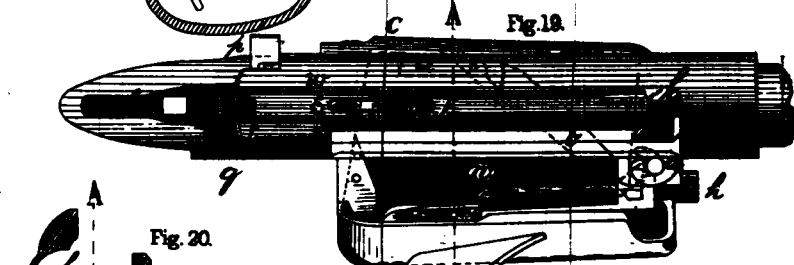
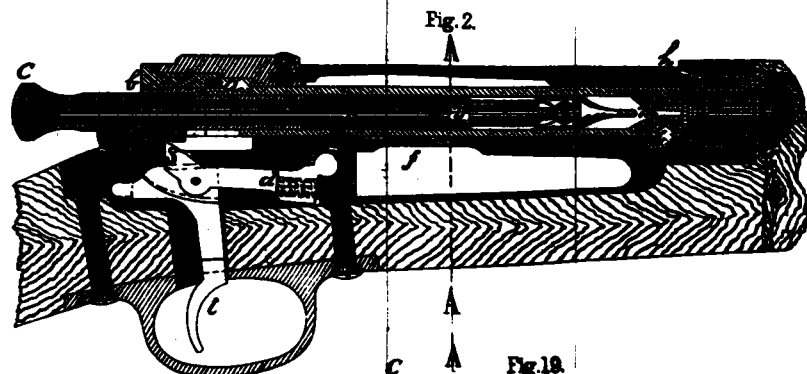
The end *q* then lies flush with the bottom of the receiver. When *p* reaches the end of its groove in the bolt, it is suddenly forced down which raises *q* (as in Figure 1), and ejects the cartridge.

The Magazine, Figures 19 to 25.—This is a box lying horizontally under the receiver and coming up on the left side, where it has its entrance to the receiver.

MODEL 1892.

(UNITED STATES)





The Gate, Figure 25.—Is on the right side, and may be rotated about the hinge *h* Figure 20, by pressure on the thumb-piece *m*.

The Carrier, Figure 23, rotates about the axis *a* and carries on its forward end the follower *d*, which pushes the cartridges into the receiver. It receives its motion from a flat spring (Figure 24 and *c* Figures 20 and 21) bearing against the shoulder *e* Figures 23 and 24.

The carrier is withdrawn from the magazine and into the gate to permit the insertion of cartridges, by the lug *b* (Figure 25) on the gate bearing against the surface *c*, of the carrier Figure 23, when the gate is opened.

The Cut Off, Figure 10, consists of the thumb-piece *p* and the shaft *b, a*. This shaft is half cut away at *a*. The portion *a* of the shaft lies in the top of the magazine and parallel to its axis. When the magazine is in use the plane surface of *a* coincides with the sides of the magazine.

By turning the shaft about 90° the curved portion of *a* projects into the magazine and bears down the top cartridge far enough to permit the bolt to pass, without touching the cartridge.

Operation.—The piece having been fired, to load,—Turn the handle to the left till the locking mass *k* is disengaged from its groove in the receiver. An inclined surface, in the rear of the receiver bearing against the handle forces the bolt slightly to the rear unseating the cartridge case.

At the same time the cocking piece is forced to the rear by the inclined surface on the bolt bearing on the surface (*m* Fig. 11), on the front of the cocking piece, withdrawing the bolt.

The cartridge is extracted by the extractor. At the end of the motion, the point *p* of the ejector reaching the end of its groove is forced down raising *q* which strikes the under side of the case and ejects it. A cartridge may now be dropped into the receiver, or, if the magazine be in use, the head of the upper cartridge will be in front of the bolt. Pushing the bolt forward forces the cartridge into the chamber. The final rotation of the handle to the right seats the cartridge by the slight forward movement of the bolt due to the action of the inclined surfaces of the receiver, locks the bolt, and completes the cocking since the cocking notch bears against the nose of the sear before the rotation commences.

MILITARY FOOD.

BY CAPTAIN CHAS. E. WOODRUFF, ASSISTANT SURGEON, U. S. ARMY.

PRINCIPLES OF THE SELECTION OF THE RATION.

A survey of the principles that have brought this ration to its present condition will greatly aid us in correcting its evils in the future.

In the first place, economy is always kept in mind. War is so expensive that the feeding of soldiers on anything except the cheapest foods obtainable would cause an effectual outcry from the statesmen who secure the funds for carrying on the war.

Second, and to some extent a corollary of the first, is the principle that the food must be a product of the country at large, neither a specially prepared article nor the output of a few manufacturers. This makes the ration consist of articles that are available in war. The army must be independent of local resources.

Third, the articles must be easily preserved in all climates by the most ignorant men.

Fourth, the articles must be easily transported, and capable of the roughest handling during transit.

Fifth, the ration is intended for the strongest and most robust men in the nation, and it is acknowledged that the sickly would be killed.

Sixth, it must approximate to the food used by the nation at large, so that there will be no rapid change of diet on enlistment that would impair the health.

For these reasons the soldier's ration has always been simple and dry. Indeed, until quite recently, there has been but little change in the ration for seventy-five years. During the Revolution the soldiers fared quite badly, though the law gave them quite a liberal ration. In 1785, after the war, it was one pound of beef, one

MILITARY FOOD.

75

pound of bread, and one gill of rum. The beef was increased to one and one-fourth pounds in 1798, and the bread or flour to eighteen ounces at the same time, at which they have since remained, except for three years during the Rebellion, when the bread or flour was increased by four ounces. At this time also (1861-1864) one pound of potatoes was issued three times a week. From time to time other changes and slight additions were made; in 1818 some dried vegetables (peas, etc.) were added; in 1832 a small amount of coffee and sugar was issued in lieu of spirits, and there have been numerous changes in salt, pepper and vinegar. The coffee and sugar have remained unaltered for thirty-two years. At the present time the garrison ration is more liberal than it has ever been before.

Now these principles must be partly changed in the future. There is not the least doubt about it, as a little discussion will make evident. In the first place, we have known for ages that war means epidemics of disease. Armies have thus been wiped out of existence, or so fearfully reduced that retreat was necessary. Military blunders have had their share in producing these deplorable results, and so has bad sanitation, and so has bad food; perhaps the latter has been the chief fault in many cases. The military blunders have not been repeated, and the sanitation has been greatly improved, so that modern wars show a vast improvement. At a medical congress in Philadelphia during the Centennial, the German delegates were inclined to boast of the phenomenal smallness of their deaths from preventable disease during the Franco-Prussian War. Indeed I have been informed that they were inclined to sneer at the fearful results of our own war, and indirectly accused us of gross ignorance. Though they were undoubtedly correct in the main, it has been remarked that if their war had been half as long as ours the results would have been just as bad. I can scarcely agree with this criticism, because in our war the most fearful and fatal sanitary errors were made in the beginning, while the Franco-Prussian War was not as long as even the beginning of ours.

In this war the Germans were the first to change some of the above principles governing the selection of the ration, and to do it successfully.

1. As for economy, it does seem strange that economy should be insisted on in this one matter of food, when we are aware that the defects and insufficiencies caused by economy may be to blame for so much disease and suffering. Then it is known that a shortsighted economy is the worst form of extravagance. If by a very liberal ration we can succeed in preventing sickness and death, the

saving in pensions alone will be enormous. If the ration costs thirteen cents as was once boasted by an army officer in favor of economy, a little calculation will show that the cost of feeding an army of 1,000,000 men in a four years' war is just about what our national pension bill will be for the next fiscal year.

The absurdity of urging economy in warfare can best be illustrated by that English military genius, who is said to have strenuously objected to the proposed manufacture of big guns, because a single shot would cost at least ten shillings. He little imagined that ten discharges of the large modern gun would cost more for ammunition than a whole engagement such as that famous one of the "Constitution" and "Guerriere."

As the present ration costs less than fifteen cents it is rather far fetched to talk of extravagance. There are few healthy laborers in respectable standing in civil life who subsist on less than one dollar a week.

The Germans obtain economy in their immense army by inculcating the idea that military service is a patriotic idea, and that the young man must make sacrifices for the common weal. It is said that he is expected to piece out his poor diet by the things sent from home. This is possible, as he never serves far from his home. We must look then with considerable suspicion on the small German peace ration remembering that the United States soldier cannot get extras from home. The French and English soldiers actually do contribute from their pay to the increase of their table fare.

In the future, it is to be hoped, that though a reasonable economy should always be kept in mind, it should *not* be the guiding principle in feeding the soldier. War is so expensive, always has been so, and is getting more and more expensive with every improvement of ordnance and means of transportation. To-day its expense far exceeds the wildest flights of the imagination of the last generation of military men, and we can reason by analogy that the war of fifty years hence will be proportionately worse.

2. It is true, only to a limited extent, that the articles of the ration must be the product of the country at large. Of course everyone understands that our country is so large and varied in climate, that there are but few articles of diet that can be efficiently grown throughout the whole length and breadth of the land. Considering the latitude, or rather the temperature, of the whole country, it is a general rule that a man thrives best when his chief diet consists of the articles grown in his own district. For instance, he must have the animal fats in the north, but he must have rice and the fruits in

the south, and must not be fed on articles grown throughout the land. In cases of invasion of the country, the army might be concentrated on one frontier, and the special articles there raised might not be sufficient in amount, so that the whole country would have to be drawn on for supplies. In this limited sense the rule will have to stand for all time to come.

3. The rule that articles must be easily preserved in all climates, though formerly of importance, is becoming less and less so as years go by. The methods of preserving food are becoming so exact, that it is now possible to keep articles in good condition for months, or even years at a time, where it was not formerly possible to keep them a day. By means of the wonderful advances in the business of cold storage, refrigerator cars, portable ice machines, and drying appliances, the commissary department, in future wars, will be found supplying the army with fresh articles, now entirely out of the question.

There is another point to which a mere reference is necessary. In cold climates, no article can be used in the field in winter that would be spoiled by freezing, or by alternate freezing and thawing. This blocks out a few articles put up in glass in fluid preservative, potatoes and all fresh vegetables, and fruits and various other articles.

The thought is now being evolved that it is not always necessary to have a ration that will keep in all climates, more than it is to have a uniform that can be worn in all climates, whether 50° below zero or 120° above. As the food might be purchased within the climatic district in which it is used, the ration in the extreme north can be of such a nature that it might spoil in the extreme south, or *vice versa*. If such a radical idea ever becomes practicable, it will greatly facilitate the process of making the ration flexible. A few years ago it was thought that the soldier of the southern summer must eat the same kind of fat pork, etc., that was used in the northern winter, but at present it is recognized that there must be a distinction, and as time goes on there is a greater and greater tendency shown to adapt the food to the place and circumstances. The addition to the ration of fresh vegetables, in 1890, has been one of the greatest advances made since 1818, when dried vegetables were added in lieu of some of the old issues, and various other substitutions permitted. The occasional issue of dried or fresh fruits of the cheaper and more easily preserved varieties, would be a boon highly appreciated by the troops in the hot districts of the South.

If two ships were to start from New York, each to be absent several years, one in the Arctic Regions and the other in the Tropics,

no one would even dream of provisioning them alike. Yet, if two armies were similarly to start from New York for long periods, one to the extreme North and the other to the hottest parts of the South, the law presumes that both shall carry essentially the same rations. We have not reached the point where it is decidedly recognized that the variety in the ration must be great enough to permit of sufficient flexibility to suit extremes of climate.

4. As to the rule that the article must stand the rough handling made necessary by the conditions of field service, it can be assumed that such a rule must always stand. It could be affected by the one remote and apparently absurd condition that improved methods of constructing roads will make such strides that the army can be followed by new railroads and supplies unloaded every night at each company street.

5. It is in reference to the assumed condition that the food is intended for only the strongest and most robust men, that there is an oversight in times of peace.

Until quite recently it was presumed that if the ration kept the soldier alive it was sufficient. The idea that it should keep him in health is modern, and logically follows both from increased knowledge of the etiology of faulty food in the production of disease, and from a contemplation of disastrous epidemics on land and sea, following upon a long continued improper food. The smallest amount of food that will keep a man alive has been approximately known for centuries, and though modern experiments make our knowledge vastly more detailed, accurate and scientific, they have added little to the knowledge that one pound of bread and one and one-fourth pound of meat daily will subsist a man for quite a long period. When we come to discuss the amount and kind of food necessary to keep him in health, we are on debatable ground. Our knowledge on this subject is not yet complete enough; we have only the theories and opinions. A man may appear to be healthy, but it is not quite certain that he may, on the one hand, be taking too much of one variety of food, generating a tendency to plethora or lithæmia, or on the other hand, living in a constant tendency to anæmia or scorbutus, with all the liability to contract other diseases from lessened general vitality and resisting powers. We all know men whose usual daily food is even more simple than the ration, but we know also that there are times, as during occasional visits from home, when they eat other things that perhaps restore the balance. Patients have often been restored to health by a change of diet made necessary by a recommended change of scene.

The military renaissance which is afflicting our army is still in the acute stage, and one of its symptoms is the desire to produce an ideal soldier. The error consists in assuming an ideal that is too high. It is away and beyond what the available material will ever permit. Both mentally and physically, the average soldier is not capable of that high individualization which is desirable in modern warfare.

In times of peace, perfectly reliable men of much intelligence and some education want more than \$13.00 a month and board; indeed, the average mental development of human beings is far less than people generally think. THOMAS CARLYLE wrote in reference to the English nation, that it consisted of so many millions of people—mostly fools. After deducting enough accounted for by CARLYLE's dyspepsia, there still remains a grain of truth. Common sense is said to be uncommon sense. Men in the lower walks of life, though apparently wide awake, are apt to have a remarkable deficiency of intelligence; indeed, men who are virtually imbeciles have gone through life in some laborious employment requiring no intelligence, and their defects have never been discovered. In times of war the average intelligence will be far in advance of what it is now, for then the volunteers coming from all walks of life will raise the standard near to our ideal soldier. There is considerable discrepancy in the claims of military men as to the actual grade of intelligence necessary in the ideal soldier. While some demand men of high average intelligence, others confidently affirm that excellent soldiers are made of men of very low average mental power—Indians and Negroes.

The greatest error, and that which concerns us here, may be found in the idea which assumes the physical development of the soldier to be so much higher than it can ever be. We all know about what the ideal should be. A medical officer who has devoted very much time to this subject, arranged a table of measurements of leg, arm, chest, abdomen, height, weight, etc., compiled from a vast number of observations. He probably took the averages. Anyhow, he sent this table to various recruiting officers, and without exception they returned it, with the remark that the men were not to be found. It is like the artist's ideal, which is never found, and one model is chosen for his arms, another for his chest, another for his legs, and so on. What it is wished to emphasize is the fact that man's average physical development is very poor, even in times of peace. It is getting poorer with every invention of labor saving machines, except where special gymnastic training is indulged in.

In war times it will be even worse, and exercises and drills now required cannot be enforced, because the men will be physically unable to perform them. For illustration of this point I have copied from Dr. GREENLEAF's article on examination of recruits, the following diseases and deformities for which we invariably reject a candidate for first enlistment, but which in war times constitute no bar to compulsory military service. It will be noticed what a miserable lot of recruits might possibly fall to one's lot, miserable I mean, from our present peace standard:

- Milder form of skin diseases.
- Parasites—lice, itch.
- Ulcers—showing probability of cure.
- Baldness.
- Slight curvature of spine.
- Deafness of one ear.
- Loss of sight in one eye or loss of one eye, and various defects of eye and vision.
- Various defects of nose and nasal cavities.
- Loss of teeth, hare lip, enlarged tonsils.
- Goitre and wry neck in some forms.
- Hæmorrhoids and hernia—milder forms.
- Gonorrhœa and other venereal diseases. Loss of testicles and various malformations of genital organs.
- Various deformities of bones and of arms and legs, congenital or the result of diseases.
- Loss or deformities of various non-essential fingers.
- Varicose veins, flat-foot, knock-knee and various minor defects of toes and feet, all of minor forms.

Indeed the rule is somewhat similar to that in times of peace for the discharge from the army of a man already enlisted. That is it must be conclusively shown that the man cannot do duty, even if he has a defect or disease that should have caused his rejection. During the conscription it is even more stringent, and men are taken even when it is shown that they are incapable of all duty in the fighting line. Such men are expected to serve as clerks, messengers and at other light duty. The company officers in the next war may find that they have soldiers who as a class are physically not only far below that ideal standard which we are now building up, but who are even below the average now obtaining.

This defective physique is possibly one of the reasons why war is so disastrous to life from the diseases incident to camp life. The men have too little vitality to resist the inroads of disease, and what

vitality they have is still further reduced by privations, hardships and exposures. Such conditions harden and strengthen men of great vitality but kill the others. The War of the Rebellion cost about 300,000 lives, of which only about one-seventh, or 44,000, were killed in battle, about one-sixth died as a result of wounds and accidents, while more than three-fifths, or 184,000, died of disease. Not having statistics at hand to verify statements regarding other wars, I can only state that to the best of my recollection, in some of the wars of the last 100 or 200 years, as high as nine-tenths of the deaths were due to disease. It is impossible to state what proportion of fault lay in the defective physique, what in unsanitary surroundings, what in exposure and what in bad food, but all were causes.

The worst feature of all this matter lies in the fact that armies usually consist of very young men, many of whom are mere boys. Their whole physical organization is so elastic that they bend, not break, under these hardships. Though they apparently recover their usual health when the war is over, permanent damage has been done, and shows itself in premature old age. This country is full of veterans who are old men at fifty.

It is a fundamental principle of physiology that the slightest loss of health due to privations and hardships makes a man less able to withstand future hardships. The old idea that a soldier must be lean, lank, bronzed, half starved, and toughened by hardships is becoming worn out. Such a result is no doubt quite desirable, and an army of such men will accomplish wonders, but it kills too many men in the process of obtaining it. Apropos of this, a military writer gives as a maxim of war that "it is a matter of only ordinary prudence for a general to avoid exposing his troops to needless privations and unnecessary hardships, lest in time of necessity they fail to meet the crisis."

A new rule as to the ration can therefore be unhesitatingly announced, that in future wars it should be liberal enough to assist in building up the defective and weakly men that it will be necessary to accept. This rule is entirely opposed to the present one whereby the food is assumed to be bad, and in peace every man is rejected who would be injured by eating it. This is not mere fancy. It is a rule for instance to reject men who have deficient teeth, because men have been known to break down on Indian campaigns because they could not masticate the hard food supplied.

AVAILABLE SOLDIERS OF NATION.

This matter can be reduced to an absurdity by showing how few men in the nation come up to the ideal standard. A recent report of the Adjutant-General shows that of all the candidates for enlistment examined in the previous year, seventy-four per cent. were rejected on the ground of moral, mental or physical disability. The last census shows that there are about 7,000,000 citizens between the ages of eighteen and thirty. If only one-quarter of these are to be taken, it gives the nation only 1,800,000 available soldiers. Now it is possible to form only a very rough estimate of the number of these young men who possess those high physical and mental qualifications that go to make up a soldier of great endurance and ability. It can be safely put down at less than 1,000,000. It might be objected that a large number of those who now apply for enlistment are from lower classes who are apt to have poor bodies and poor minds, and that in war the young men of higher walks of life will enlist. This latter class will be far healthier and may prove to have a smaller percentage of rejections, but this class will contain many men of sedentary habits and poor physique, so that it is quite possible that the proportion of rejections will be more than seventy-four per cent. Again, men between the ages of eighteen and twenty-three are not usually fully developed. They are mere boys and not able to stand the fatigue of war. NAPOLEON strongly objected to the habit of sending boys to his army, as they served only to litter the roads with exhausted soldiers.

It can then be safely estimated that if the country is scoured from end to end, not three-fourths of a million young men will be found to possess the qualifications of the ideal soldier. If a great war occurs, it will be impossible to raise the necessary force of 250,000 men without taking men of greater age and of much poorer physique than we now consider the ideal. There are 13,000,000 citizens of militia age—18 to 44, inclusive—and it is said that of these 9,000,000 are fit for military duty of some sort. This great number shows conclusively that the soldier in war is not to have a very high physical development.

INJURIES OF BATTLE.

Various other conditions point to the necessity of having a liberal war ration. After a battle the wounded are looked after as quickly and efficiently as the force of surgeons and their equipment will permit. It is a time of great hurry and confusion, and it is quite

evident that the surgery is done under exceedingly great inconveniences. Notwithstanding all the care and forethought given to this subject, each war teaches a lesson in regard to these wounded. There is a fearful mortality. Wounds that ordinarily heal kindly and rapidly, are apt to take on severe inflammation, suppuration or gangrene: the patients suffer from various forms of blood poisoning, and many die in a short time of wounds that in ordinary times are always followed by recovery. Many die of pure exhaustion, without any of the above accompaniments. This is a state of affairs that has existed from the earliest times, and has been described in medical books two or three thousand years old, and it is the same in the last great war of Europe. If the causes are known, it is inhuman not to make a vigorous effort to remove them.

The causes of this terrible suffering and mortality are found in the condition of the patient and his surroundings. He has been hard pushed for a more or less prolonged period, previous to battle. His food has been poor and scanty, and he is exhausted. He may be dirty in the extreme. He is crowded into temporary shelter with other wounded and becomes an easy prey to the germs of disease, which we now know are the causes of the complications mentioned. The recent advances in surgical science can be depended on to remedy much of the evil, but it is impossible to expect good results when the patients are already exhausted by the fatigues and privations supposed to be unavoidable just previous to battle. It is certain that if the men were strong and well fed, there would be a remarkable change for the better. It is, therefore, incumbent upon us to do all in our power to place them in such condition of health that recovery can be reasonably expected if they are wounded in battle.

Instead of the soldier entering an engagement lean and exhausted, from insufficient or improper food, he should be strong, hearty, well fed, and with an immense reserve of vitality that will rapidly carry him through a successful convalescence. It is a question of ordinary prudence, let alone humanity.

The sixth rule, as to the ration being similar to the national food, must always stand. The food which an Italian, or Turkish or Hindoo army would flourish on, might be utterly impossible to Americans, and this from differences of taste and habits. Human beings can, by degrees, become accustomed to any diet, even though it be outrageous; they can subsist chiefly on fruits in the tropics, or chiefly on fats in the Arctic regions, but any rapid change of diet is disastrous. Now, as the militia when mustered into the service of the United States must subsist on the army ration, it is a cardinal

principle that the food supplied must closely approximate that to which they are accustomed. As regards the present ration in garrison, this is approximately so, but it has not always been the case. The Secretary of War (Mr. CALHOUN), in 1818, reported to Congress that the mortality during the Wars of the Revolution and 1812, from the change of a plentiful mode of living to that of the camp, "was probably greater than from the sword." As Americans live more liberally than Europeans in similar walks of life, we have at once an incontrovertible reason why the United States ration should be more liberal than that of any European army. The American laborer has meat every day, while the European laborer may have it but once a week, and the American soldier must and does have meat three times a day.

The garrison ration can occasionally be made so liberal that the sudden change to the roughest field ration is apt to produce harm for the above reasons. Complaints have been made on this very point in Indian campaigns in past years, when men have been suddenly called out. To be sure, they could be kept in a species of training when field service is expected, but as field service is apt to be at unexpected moments, we would have to be in continual training, and in that condition life is scarcely worth living. The only proper thing to do is to make the field ration approximate the garrison ration, so that the change of going from one to the other will be as small as possible.

The German army in peace is never without fresh beef and fresh bread; even during the summer maneuvers the contractors follow the troops and make deliveries of food. Field bakeries are established on the railroad nearest to the troops, and each company sends its wagon every one or two days for bread. This is possible in such a thickly settled country.

There is one side thought that is the legitimate outcome of this rule. Nature gave every animal on earth a pleasure in eating, and it is this pleasure which keeps animals in existence. If man's healthy normal appetites are utterly ignored, he will suffer from those diseases, both bodily and mental, which are characteristic of those religious fanatics who try to obtain the favor of their gods by resisting the wholesome promptings of Nature. With too much attention to appetite the man degenerates into the glutton. There must be the golden medium, and it is not right to neglect the matter utterly, as has been the case with soldiers. Nor is it right to consider the soldier's stomach as nothing more than a machine for converting the energy of the food into work performed in marching,

drilling and fatigue duty—300 grains of nitrogen and 500 of carbon for ten hours of fatigue. The soldier's appetite and taste must be recognized, and the ration made palatable in the field.

The whole matter of this discussion can now be put into a nutshell, for it will be noticed that everything points to the one fact, that the ration in war must be *liberal and varied* in order to prevent disease, strengthen the men, and increase their contentment. By these means the army will give out its greatest amount of work, and not fail when the greatest support is needed.

It is well known that on rare occasions the soldier is called upon to perform the most laborious duties, under almost inconceivable exposures and hardships, and it can well be assumed that at such times his food should be liberal to the point of extravagance.

CHANGES IN RATION.

Now it may be asked, How is all this to be accomplished? Surely not by the old methods, for it can be assumed that intelligent men have been thinking on the subject for generations, and every reasonable idea tried. Indeed there has been a retrogression, for the present field ration is not nearly as good as that which General WASHINGTON ordered for his troops during the Revolution, although it is known that his soldiers at that time never received their regular ration.

A great improvement can be made with old methods by recognizing that the ration must be flexible enough to suit extremes of climate, and be varied enough to prevent disease. The difficulty has always been with transportation and preservation. The proper food could never be carried. Changes in the ration will result from the recent wonderful improvement in the preservation and preparation of foods. The advances in preservation of food are due first, to our knowledge of the causes of decay of organic substances, and second, to improved mechanical contrivances for preventing such decay. It is now known that putrefaction is always the result of the growth of various kinds of microscopic plants called bacteria. Keep out the bacteria and decay is impossible. The body of an animal will lie on the ground where it died, until torn to pieces by winds, freezing weather and the other causes that break up rocks. Without bacteria a moderate amount of oxidation will go on just as in the case of rocks that are thus broken up, but it will be so slow that in a short time all the carbon and nitrogen of the air will be locked up in dead animals and plants, and life will cease. Hence preservation of food is merely preventing the growth of bacteria.

These microscopic plants, like any other live thing, require warmth, moisture and food. They cannot grow and flourish below 42° Fahrenheit nor above 110°. The best temperature for nearly all of them is that of the interior of the human body, 99° to 100°; this is why putrefaction is so common in summer and absent in winter. Freezing, though it prevents their growth and kills a few, has no fatal effects whatever on the largest number of species. In the spring time they are as lively as ever, though they may have been subjected to a temperature below zero for several months. Frozen substances cannot decay, and there is no limit to the time in which food can thus be kept perfectly good and fresh. In 1799 some peasants in Siberia discovered projecting from an ice bank the body of a huge animal and the wolves had been eating the flesh which was still fresh. Scientists were soon informed of it and secured the bones, hair and the remainder of the tissues that had not been eaten, and it was found to be a mammoth that had been overtaken by storms in the last glacial period, buried by snow, killed, its body frozen and there it remained until the ice melted. Its skeleton and hide are now in one of the Russian museums. The last glacial period was somewhere over 8,000 or 10,000 years ago; geologists vary in their estimates; they used to say it was 300,000 years ago. Anyhow we thus see frozen meat kept fresh and fit for food for more than 8,000 years, possibly 25,000 years.

Though they do not grow well if the temperature is over 110°, bacteria are not killed with less than fifteen to sixty minutes' exposure to a temperature of 160°. Boiling for thirty minutes kills nearly all of them. Hence food put in cans boiled one-half hour to kill bacteria, then made air tight to exclude new ones, will keep indefinitely without decay, though it may become softened by the dissolving action of water present, and thus become undesirable as food.

As bacteria require moisture, we see why it is that putrefaction is impossible if there is absolute dryness, though it must not be understood that dryness, as ordinarily understood, kills them any more than it kills seed wheat or corn.

Some bacteria require oxygen, others will not grow unless oxygen is excluded, but by far the largest number of species will flourish whether oxygen is absent or present.

Finally, bacteria will not grow in the presence of substances strong solutions of which are poisonous. For this reason decay is impossible if the substance is saturated with salt, alcohol or vinegar, and we find food preserved in all these ways. If bacteria are kept out in the above ways, decay is impossible. There is a pathetic

poem which illustrates the above quite well, though, of course, the truth of the facts cannot be vouched for. A young miner at work was killed by an explosion of fire-damp, and the shaft in which he was working was hermetically sealed by falling rocks. The air was driven out by the gases from the coal and these prevented the growth of bacteria. His body could not dry because there could be no evaporation. Forty years afterwards the shaft was reopened, his body was discovered, and brought to the surface. He was not recognized, of course, and an old woman was sent for; she proved to be his sweetheart, who had remained unmarried. As the corpse had remained unchanged she recognized it at once, and she could not realize the length of time that had separated them. The pitiful lamentations of this old woman over the corpse of a young man, her betrothed husband, were the theme of the poem.

These principles of bacterial life are mentioned in detail, because on them depend the new methods of preserving military food, or at least new modifications of old methods. It has been customary for ages to preserve food by cold, drying, and killing bacteria by heat, though the method of drying was formerly the chief, if not the universal means. It must be kept in mind that the above facts about bacteria and decay have been discovered quite recently, some of them since the older officers now in the army have entered the service. The machinery used is of still more recent origin; indeed, the whole subject is so new that it is liable to upset all our old ideas on rations, preservation of food, and even certain details of the art of war itself.

[TO BE CONTINUED.]

PROFESSIONAL NOTES.

THE BUFORD MEMORIAL.

"Subscriptions to the BUFORD Memorial, to be erected at Gettysburg, are coming in rapidly. An immediate remittance is not essential, but an early transmittal to the treasurer of a subscription slip, filled in with the amount intended, will enable the Executive Committee to form an approximate estimate of the sum to be realized. The War Department has approved the application of the association for the four guns of TIDBALL's battery with which BUFORD opened the battle of Gettysburg, and they will be incorporated with the monument; two are at Governor's Island and two at Watervliet Arsenal. Meetings of the Executive Committee will be held at the Army Building on the second Monday of each month."—*Army and Navy Journal*.

"THIS FIRST INSPIRATION OF A CAVALRY OFFICER AND A TRUE SOLDIER DECIDED IN EVERY RESPECT THE FATE OF THE CAMPAIGN. IT WAS BUFORD WHO SELECTED THE BATTLE-FIELD WHERE THE TWO ARMIES WERE ABOUT TO MEASURE THEIR STRENGTH."—COUNT OF PARIS, CIVIL WAR IN AMERICA.

LOSSES IN BREDOW'S CHARGE AT MARS-LA-TOUR AS GIVEN BY KAEHLER.

[The following statement will give a correct idea of the number of officers and men killed and wounded in Bredow's charge at Mars-la-Tour. The German Official History gives the losses only in gross, so that it is impossible to learn from it just how many men were killed and wounded, and how many captured or missing, an important thing to know in studying the results of a cavalry charge like that in question.—EDITOR OF JOURNAL.]

Seventh Cuirassiers.—Of the remnants of the cuirassiers, three platoons were formed. After the third squadron (sent into Tronville Copse) and first platoon of first squadron (on relay duty) had rejoined, the regiment formed two squadrons of four platoons each, not exceeding 220 riders of all grades. Not counting those dispersed men, who turned up during the next few days, the losses of the regiment are as follows:

Killed	1 officer,	43 men,	33 horses.
Wounded	6 " "	72 " "	25 " "
Missing	— " "	83 " "	203 " "
	7 " "	198 " "	261 " "

PROFESSIONAL NOTES.

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Sixteenth Uhlans.—Of the Sixteenth Uhlans there reassembled at the first moment at Flavigny, six officers and eighty men, two officers and fifteen men rejoined by way of Mars-la-Tour. After the squadron sent against the Tronville Copse and a few small detachments had rejoined, the regiment had in the ranks, in the evening, twelve officers and 210 men, not a few of whom were slightly wounded. Not counting those that rejoined, the losses are:

Killed	2 officers,	28 men,	172 horses.
Wounded	5 " "	101 " "	28 " "
Missing	2 " "	54 " "	— " "
	9 " "	183 " "	200 " "

The author gives the number of horses in BREDOW's charge at 805, and states that there were a few more than 600 left when the charge was spent, and that they were then charged by French cavalry as follows:

First and Ninth Dragoons	each, 300 =	600 horses.
Seventh and Tenth Cuirassiers	400 =	800 " "
Fourth Chasseurs à Cheval	four squadrons =	400 " "
Fifth "	five squadrons =	500 " "
Seventh and Twelfth Dragoons	each, 300 =	800 " "
		3,100 " "

CARL REICHMANN,
First Lieutenant Ninth U. S. Infantry.

The following letter from Captain FAIRMAN ROGERS, Philadelphia City Troop, is published for the information of the members of the Cavalry Association:

PARIS, January 14, 1894.

The Secretary U. S. Cavalry Association:

DEAR SIR:—Some years ago I said to the Secretary of the U. S. Cavalry Association that my collection of books on "Horsemanship," which is the largest in America, was accessible at my house at Newport to any officer who wished to see or to use it.

As I have given up my Newport residence, I have given the whole collection to the library of the University of Pennsylvania at Philadelphia, where it will be accessible to every one, and where I hope it may be useful to some one who is at any time writing on such subjects.

I have been collecting these books for many years, and I think that the collection is nearly exhaustive for English and French books, while including a large number in other languages. It is particularly rich in the oldest books on the subject.

You might think it worth while to notice the fact of its transfer to the University library in the JOURNAL, for the information of any officer who might wish to consult it.

It is much larger than the West Point collection was some years ago.

Yours respectfully,

FAIRMAN ROGERS.

SOME MECHANICAL ASSISTANTS TO CAVALRY INSTRUCTION.

It was my duty during the past winter to set up twenty-six recruits, one of whom came to the troop accompanied by a report that he had been brought before a board of officers at Jefferson Barracks,

and found mentally incapable of performing the duties of a soldier, but was ordered held to service; consequently that weapon, the saber, of which we romance so much, and with which we practice so little, had to be put in his hands. It was impossible to teach this man in the ordinary way. Returning from drill one day I found hanging in a back room of my quarters a *D* ring. Drawing my saber I made a tierce point at it, and was surprised to find how easy it was to miss it. Suspending the ring in a doorway I got considerable exercise before I could make a successful tierce, right, left, and rear point.

The next day I stretched a lariat across the barracks, and tied *D* rings to it, as shown in Fig. 1. Placing a squad of old men in front of the line, at such distance that the saber would project through the ring about six inches when the arm was extended, I found that none of them could make a successful point. Recruits and old men were then put to work, with the information that as soon as a man could put his saber through the ring three out of five times at tierce, right, left, and rear point, he could drop out for that drill. Facing the rings, five trials were made with tierce point. A right face, left face, and about face, put the man in position for left, right, and rear point, respectively. Five trials were made with each point. Soon the results were very gratifying; at the command, "Point," eyes were fixed on the rings, and every saber went forward at something, and with a force that would have sent it through a man; interest was excited, and drill lost its humdrum. The recruit mentioned above, that could not understand the language of the Drill Regulations, understood "Put your saber through that ring." The major of the squadron, at the end of a week's practice, stated that the recruits were two weeks ahead in saber exercise of a detachment trained in the ordinary way.

This practice demonstrated that the usefulness of a weapon depends on the amount of proper practice a man has with it, and that just as good thrusting can be done with a curved saber as with a straight one, provided men are trained to it.

Cutting at heads with the ordinary head and post requires from one to two dismounted men at every post to replace the heads. In Fig. 2 an attempt has been made to get a head that will replace itself. The head is of leather, stuffed with hay, secured to a block by means of straps; the block is screwed to the bent top of an iron lever, the lever is placed in a slot in a 2 x 4 inch post and pivoted on a bolt, as shown. The bottom of the lever is bent to the front and a weight attached to it; two horseshoes were found to be heavy enough. On the back of the post (not shown in the cut) is screwed a strap of iron across the slot to prevent the head going too far down. The objection to this post is evident, it can be used only for cuts. Apparently the lever coming to the front is an objection, but it is not so in practice. It was found to work well for cuts; for points another separable head can be placed on top.

The prime requisites of a good hurdle are solidity and ease. It must be solid enough to prevent the horse thinking he can push it

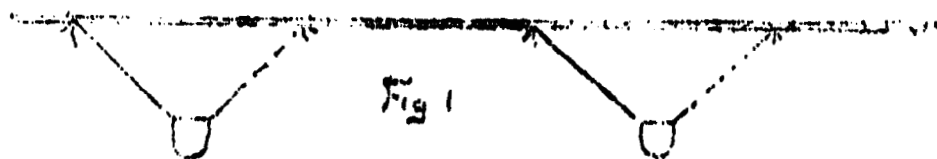
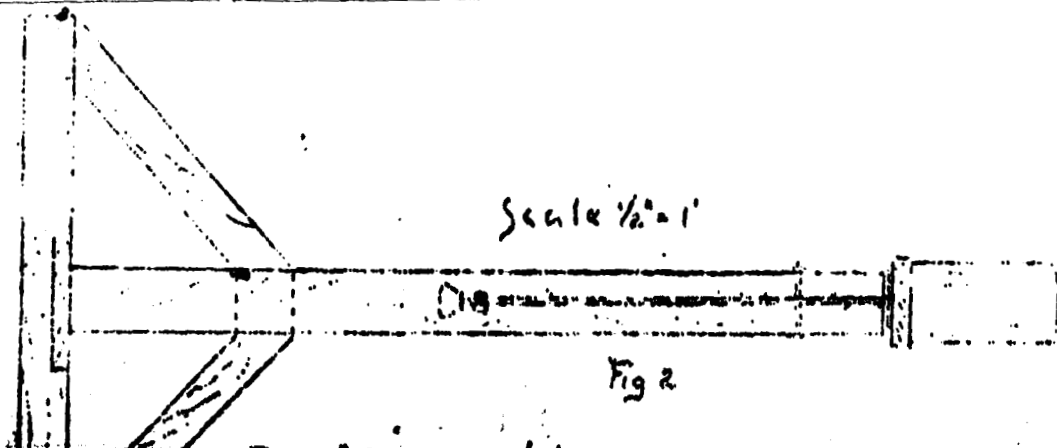
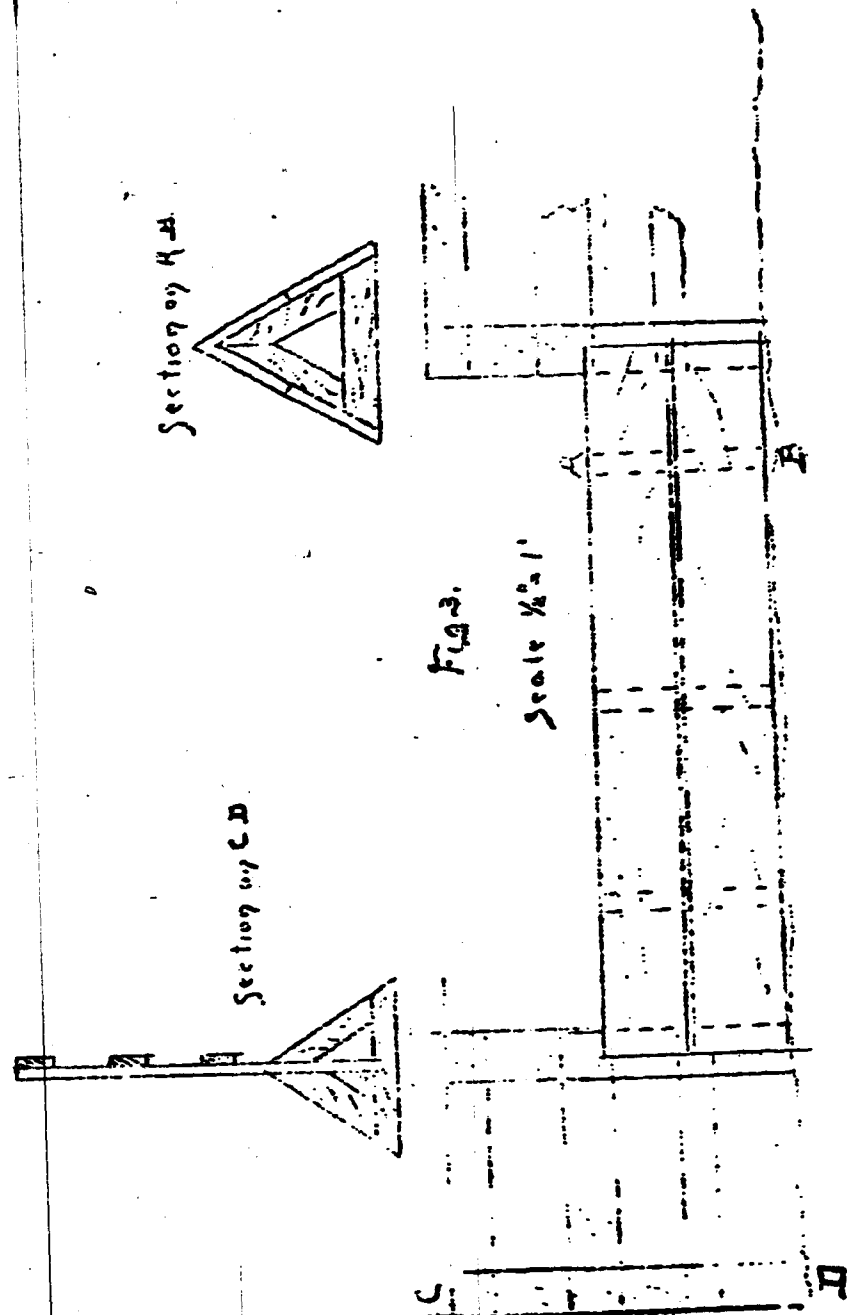


Fig 1



Scale $\frac{1}{2}'' = 1'$

Fig 2



over, and the place of jumping easier than adjoining parts. In Fig. 3 a form is given which is used at a few posts, and has been found good. It consists of a solid hurdle, triangular in cross section, and from a foot and a half to two feet in height. A slot is cut in each end of the hurdle, and wing fences inserted, as shown. Bars may be placed on pins in the holes shown, and the hurdle raised as desired, but it must never be made higher than the wing fences. A horse approaching this hurdle recognizes that he cannot turn it over, he cannot step over it, and it is better to jump it than attempt the wing fences.

S. D. ROCKENBACH.
Second Lieutenant, Tenth Cavalry.

BOOK NOTICES AND EXCHANGES.

Books received and to be noticed in next number of the JOURNAL:

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MODERN AMERICAN PISTOLS AND REVOLVERS. By A. C. Gould (Ralph Greenwood). Illustrated.

MAXIMS FOR TRAINING REMOUNT HORSES FOR MILITARY PURPOSES. By J. Y. Mason Blunt, Lieutenant Fifth Cavalry, U. S. A.

ANNUAL REPORT FOR 1893 ON THE U. S. CAVALRY AND LIGHT ARTILLERY SCHOOL, FORT RILEY, KANSAS. Colonel James W. Forsyth, Seventh Cavalry, Commandant.

THE PRINCIPLES OF STRATEGY. Illustrated mainly from American Campaigns. By John Bigelow, Jr., Captain Tenth Cavalry, U. S. Army. Second edition, revised and enlarged.

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No. 1: Comments on Prince Frederick Charles in the work "The War on the Loire." Charleston 1860-1865. Limits of Age in the French Army. No. 2: Comments on Prince Frederick Charles (continued). French Siege Artillery. Reorganization of the Swiss Army. No. 3: History of Uniforms of the Army under Frederick William the Third. The Infantry Attack. No. 4: History of Uniforms under Frederick William the Third (concluded). Drill of Reserves in France. No. 5: The Infantry Attack (continued). Sanitary Regulations for the German Navy. Maneuvers of the Second and Sixth French Cavalry Divisions. No. 6: Comments on Napoleon I. Infantry Attack (continued). No. 7: The Shortest Route to Constantinople. Infantry Attack (concluded). No. 8: Bayreuth Dragoons and General Chasot. The First Cavalry Division in the Battle of

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Beaune la Rolande, November 28, 1870. No. 9: Cabinet Order as to Reduction of Infantry Pack. No. 10: Our Infantry Tactics of To-day. Foreign Comments on Great Initial Velocities and Rapid Firing Guns for Field Artillery. Grand Maneuvers of the French Army in 1894. No. 11: Register of the Saxon Army for 1894. Our Infantry Tactics of To-day (continued). The French Army at the End of the Year 1893. A New Russian Ammunition Cart. No. 12: A Few Words on the Third Corps at Beaune la Rolande. Our Infantry Tactics of To-day (concluded). Foreign Comments on Great Initial Velocities and Rapid Firing Guns for Field Artillery (concluded). No. 13: Retrospects on the Training of Infantry. The New Italian Minister of War and His Program. Victory of the Italian Colonial Troops over the Dervishes at Agordat. The Field Artillery of the United States. No. 14: Metz Defended by Armored Fronts.

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No. 2: Russian Winter Maneuvers. No. 3: The Future of Chili and Her Army, by a Russian Officer. Summer Dress for German Officers. No. 4: The Subsistence of the French Army in War. No. 5: The Railway System of Russia. The Subsistence of the French Army in War. No. 6: French Military Operations in the Soudan (with map). The Flying Machine of Prof. Wellner (with plate). No. 7: The Military Career of Prince Bismarck. Italian War Dogs. No. 8: The Railway from Senegal to the Niger (with map). Maneuvers of the Hospital Corps. No. 9: The Target Practice Schools. The Lightening of the German Soldier's Equipment. No. 10: Timbuctoo. The Sea Route from Europe to Siberia.

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October 1893: Mountain Warfare as Applied to India, by Captain F. C. Carter, D. A. A. G. Allahabad District (with numerous maps). November 1893: The War Game on the Model, by Captain H. A. Bethel, R. A. (with maps and plans). Report on Swimming Instruction as Carried Out by the Ninth Bengal Lancers

(with plate of various kinds of rafts used). Cavalry Maneuvers, by Lieutenant-Colonel P. Nerette, Fourteenth Bengal Lancers (with numerous plates).

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Organization of the Armies of Europe, by Captain O'Connell.
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MILITARY FOOD.

BY CAPTAIN CHAS. E. WOODRUFF, ASSISTANT SURGEON, U. S. ARMY.

[Conclusion.]

NEW METHODS OF PRESERVING FOODS.

LET us first take up cold storage, refrigerating apparatus and ice machines. The perfection of this new class of machinery can be imagined when it is stated that the total cost of making a ton of ice is only 75 cents. In rooms for cold storage almost any degree of temperature can be maintained, though it is presumed that for extremely low temperatures—that is, below zero—the rooms are quite small. It is understood that the immense proportions and usefulness of this new industry have induced the manufacturers to unite in one grand building at the Columbian World's Fair. In the matter of preserving fresh meats by freezing, the inventions seem to be perfect. This cannot be better illustrated than by the following clipping from the *Chicago Tribune*:

"The importation of frozen meat into England is increasing year by year. From fifteen to twenty per cent. of all the mutton consumed in the British Isles comes from New Zealand and the River Plate, to say nothing of other sources of supply. Last year New

Zealand sent nearly two millions, and the Plate more than one million carcasses. Australia is coming to the front. In three years its exports of carcasses have risen from 90,000 to 340,000, and there is no doubt that the business in a very few years will assume vast proportions. Sheep raising has also been begun in the Falkland Islands, which exported 20,000 carcasses last year as a beginning. The whole of this trade has sprung up in less than ten years. What it may be ten years hence can scarcely be guessed."

Captain H. G. SHARPE, C. S., U. S. A., is authority for the statement that the French government is taking the initial step towards applying this new industry to the purposes of war. They have succeeded in keeping dressed beef in a perfect condition for three or four months with the present appliances. It can be assumed that the machine and cold rooms will soon be so perfect as to lengthen this time indefinitely. It has been found that the frozen carcasses can be transported in common freight cars three or four days in the hottest weather before there is any sign of deterioration of the meat. Cars could be specially constructed with double sides, between which will be non-conducting material to keep out the heat. In these it can be assumed that the frozen meat can be kept cold and fresh for a much longer time. Of course regular refrigerator cars would lengthen the time enormously. The wagon transportation from the railroad to the army in Europe is so short that it can be left out of consideration entirely—any covered wagon will do.

The French probably intend ultimately in time of war to let contracts for the immediate delivery to government storehouses of four or six months' supply of frozen meat for the whole army. The Department of Supply may keep it frozen until used, or perhaps that may be expected of the contractor under government supervision. As needed at the front it will be shipped in ordinary cars or specially constructed refrigerator cars.

In the United States, government cold storage rooms can be erected at many points, and a large supply kept on hand. Such a system will entirely free the army from the dangers attendant upon the failure of the contractors to live up to their promises, a failure that in the past has wrought incalculable harm. In case of a large foreign war, I am informed that the army can never be more than sixty miles from a railroad. This distance can be easily covered before the beef begins to spoil. The commissary officer of this post has calculated that it is perfectly feasible in the United States, even now, to buy in open market, and pack away in appropriate cold storehouses, enough fresh beef to supply an army of 1,000,000 for

six months. It would take about ten or twelve storehouses, 100 by 300 feet, and high enough for three tiers of beef.

A moment's thought will show what a revolution this matter of cold storage can make in military practices. It will obviate all necessity of keeping live cattle near the army, a system that so often results in diseased animals and fatal epidemics among the soldiers. It will help to wipe out of existence all the salt meats formerly supplied, and will thus avoid that large list of diseases of stomach, bowels and nutrition, that salt meats have been accused of causing. It will allow of a constant supply of fresh fruits and vegetables, the absence of which is the bane of field service. It will be the chief means of supplying that variety and generosity of diet which must be insisted on in the future. Of course cold storage can be of little or no benefit to the army in its present field duties on the frontier. The troops are in small and numerous detachments, at long distances from the railroads, all of which conditions would prevent any practical method of supplying fresh things. Rations must be carried along. In a great civilized war, it will undoubtedly play an important part, and unless it is taken up in earnest the greatest possible efficiency cannot be obtained from the troops. In peace times, at posts where beef is very bad, they could be supplied with frozen beef from other places. During several winters from 1867 to 1877, experiments were made in the Department of Dakota, by freezing beef and then packing it in snow until used. The loss in weight was very little, or nothing, even after two months. The reports of the officers were quite varied, some praising the beef to the skies, while others strongly condemned it, often on such absurd grounds as loss of nutriment by freezing. The soldiers liked it, as a rule, and made no complaints. The only reasonable objection was to the effect that the beef lost some of its flavor after two months. This may have been due to poor cooking or to the method of thawing, whereby the beef was exposed to a hot fire and the external parts converted into a species of dried beef. It was not as good as freshly killed beef. Beef kept in cold storage rooms need not be frozen solidly and then injured by thawing. It has not the above objectionable loss of flavor, but is said to be distinctly better than freshly killed. Even if it were not as good as freshly killed beef, it is decidedly better than salt meat, and it could be issued long before it began to deteriorate.

As mentioned before, the chief and almost the only method of preserving food has been by drying. The natural evaporation caused by the heat of the sun has been the only means of securing

dryness. New inventions have displaced this method in many instances. For a long time there has been in successful operation quite a variety of arrangements for drying foods either by means of hot dry currents of air, or by vacuum pans, quite complicated machinery being necessary.

Water is also excluded from powdered substances by means of pressure. Powerful machines are constructed that will allow of a pressure of several tons on a small surface. By these methods of drying by machinery there is placed on the market a large class of articles designed for picnic and camping parties. They are also designed to make housekeeping easy, and are in actual use for this purpose. There are compressed teas and coffees, coffee ready for use as soon as mixed with water, compressed, dessicated or evaporated fruits and vegetables, dessicated and powdered meats, and hosts of special articles that cannot be mentioned here. Among these there are numerous articles most excellent for field service at any place, but particularly on the frontier, where it is so hard to get any variety, where the ration must be dry, and where it is absolutely impossible to get the fresh things we have found so desirable. The army, with great profit to itself, can use the recent inventions in use in civil life. The great advantage of these things consists in the fact that they are perfectly available even where the transportation is limited.

These new processes are now being adapted to the needs of the army, in preparing new kinds of military foods. The Germans have been the first to take advantage of drying and compressing processes in the manufacture of a dried compressed bread. The great difficulty in the use of bread for field use consists in the inability to supply it so that it will keep a long time and be digestible. Hardtack is ruinous to many soldiers, as already pointed out. If baker's bread is compressed, it sinks into a heavy dough. Only strong stomachs can digest it, and it is far worse than the wet, soggy, hot, breakfast bread with which we cultivate dyspepsia. If the bread is merely dried, it is too bulky for transportation. By a new process, which probably consists in drying the bread and at the same time compressing it by improved machinery, the Germans have secured a variety of field bread which is spoken of in very high terms. Small bits of it, thrown into soup, swell up like a dried sponge when thrown into hot water. The soldiers are said to be very fond of it, and as far as known it is entirely successful.

The French are not far behind, as can be seen from the following quotation from *The Ontario Medical Journal*:

The French Department of Intendance has been experimenting with dried bread, which is said to be superior for campaigning purposes both to biscuit and ordinary bread. From the results of the experiment, which are given in the *Revue du Service de l'Intendance Militaire*, it appears that this dried bread will absorb from five to six times its own weight of water, milk, tea, coffee or *bouillon*. Biscuit absorbs hardly its own weight of liquid, although when thoroughly dried it contains only about ten per cent. of water, whereas the bread contains from twelve to fourteen per cent. It can be made in cubes of convenient form for packing, and will probably be found to be a not less important improvement than those recently made by Germany in the same department, as it forms, together with the soup which it absorbs, a fairly substantial dinner, besides being simple, inexpensive and portable."

This new bread is probably the long wished for solution of the question of bread for field service.

CANNING.

Next comes that huge business, the canning of all kinds of foods. In all of these the processes are similar. The food is introduced into tin cans and the lids soldered on, a small vent hole being left open. The can is then kept in boiling water for a certain length of time, to kill all bacteria. While still hot, the vent is soldered up and no further entrance of bacteria is possible. Foods thus prepared will keep in good condition for quite a long period. Among the vast numbers of articles of this class, are some that are in use now by the army, for the field or in traveling, when cooking is impracticable, such as canned meats, fresh and corned, and canned baked beans, but there are many others that are available. It is needless to remark that very many articles, like canned asparagus and canned corn on the cob, etc., are not available, as they give too much bulk for little nutriment. Many canned articles are so thoroughly prepared, that as far as their uses in the economy are concerned, they are virtually fresh articles, if too much time has not elapsed since they were canned. General GREELEY used them in the Arctic, and General WOLSELEY in the Nile expedition, and both report them excellent, even after exposure to such extremes of temperature.

SPECIALLY PREPARED FOODS.

The next class of military foods includes those that are specially manufactured from many different articles. It is the most important to the military man, because it is the class that has the greatest effect in modifying the principles of strategy, as will shortly be ex-

plained. It is probably true, that from the most ancient times, attempts have been made to subsist armies on artificially prepared foods. PARKES, in his work on "Hygiene," gives a list of quite a number, but states that as a general rule they have been unsuccessful. The failure, or rather the limitations of success, have been due to lack of proper machinery; but possibly the greatest fault consisted in the ignorance of what a food should consist of. We have seen that new and efficient machinery has but recently been invented, and that much of the difficulty has been overcome. It is chiefly in recently acquired knowledge of the proper ingredients of a food that success is becoming possible, notwithstanding the fact that the knowledge is still only approximately correct. Here then is the place where the discoveries of physiologists are stepping in to give great aid to the men in command of troops.

These prepared foods consist of a powdered mixture of various partially cooked articles, so combined that there is the proportion of protein, carbohydrates, fats and salts which we consider appropriate for the food of a healthy man undergoing considerable labor. The only ones that have been highly successful are those composed chiefly of peas or beans. We have seen in the table that these leguminous vegetables contain quite a large amount of protein, and carbohydrates, and the fats, salts, extract of beef and flavoring extracts are added in the manufacture. The first of these successful foods is the celebrated "Erbswurst" or iron ration of the Germans. According to Captain SHARPE, "Erbswurst" is a combination of pea meal and other articles, invented by a German cook named GRÜNBERG, whose secret consisted in his method of preserving the legumine from the decay to which it is so prone. The German government purchased the secret for \$25,000.00. It was first used on a large scale in the Franco-Prussian War by the Second Army commanded by PRINCE FREDERICK CHARLES, who reported its great value to the War Ministry July 16, 1870. The food was composed of pea meal, fat and bacon, and an extensive factory for making it was established at Berlin under the supervision of Army Intendant ENGLEHARD. The factory commenced work on August 8th, and in a few days furnished the first 100,000 pea sausages which under the name of "Erbswurst" became so widely known. This article of food met with such general approval that for a long time the factory had to supply the whole army with it. The factory ultimately extended its business to making other kinds of meat preserves and altogether sent some 40,000,000 rations to the field army. Other factories were established at Frankfort-on-the-Main and Mainz.

This description of food had the advantage for the commissariat in being lighter for transport, and for the troops, especially for those on outpost duty, in being more easily prepared for consumption. The unavoidable sameness of the ration was successfully compensated for by the large stores of wine found in the neighborhood of Paris, and by the occasional issue of an extra ration of brandy.

PARKE's "Hygiene" states that when it was used too constantly not only did the men dislike it but it was liable to produce flatulence and diarrhœa. A soldier who has lately returned from a visit to Germany informs the writer that the soldiers in private conversation still speak of it in the highest terms.

It is understood that this food is given to the German soldier with strict orders not to use it until he is separated from the wagons and cannot get the regular ration. In using it he procures a cup of hot water into which he stirs the powder. It makes a rich, savory and nourishing soup. The "iron ration" has been lauded by enthusiasts as the chief cause of the German success in the Franco-Prussian War. Without Erbswurst it would have been impossible for the soldier to stand the fatigue necessary to carry out the plan of the campaign—human beings could not have made the effort. It is not known how much truth there is in such a strong statement.

On account of certain seasoning ingredients in Erbswurst English and American soldiers do not like it. Several years ago it was issued for trial to some U. S. troops and the reports are said to have been uniformly unfavorable. The English have overcome the difficulty by making a more palatable pea soup called Kopf's. It is entirely and eminently successful, and is in use in the field wherever there is a battalion of the British army. In the United States there are several firms which make these soups for family use, and they are excellent for the army.

TABLE XIV.—COMPOSITION OF SOME PREPARED MILITARY FOODS.

	Water.	Protein.	Fat.	Carbo- hydrate.	Wool- fiber.	Ash.
Erbswurst.....	12.09	31.18	3.08	47.50	.....	6.15
Erbswurst, as first used.....	.....	16.00	35.00	27.00	.....	.....
Erbswurst, 1887.....	.....	15.70	23.00	.....	.....	.....
Dried pea soup (1).....	7.58	16.93	8.98	53.44	1.34	11.73
Dried pea soup (2).....	8.08	15.81	24.41	36.78	1.69	13.53
Kopf's pea soup (used by the English army).....	4.78	21.09	17.25	46.45	4.40	6.03

In the table are arranged some analyses of these pea-meal mixed foods. The English pea soup appears to be drier than the others, and as the actual analysis above shows it to be so, it will probably keep better than the others. The percentage of fat though not great enough for American stomachs, is far more than the first specimen of Erbswurst. If it were more fatty it would not keep as well as it does. Several American firms make dried pea soups and it is regretted that analyses of their products are not available for comparison.

These prepared and partially cooked foods are never intended for sole use, and unfavorable comment may arise from the fact that they are not satisfactory when so used. They are inappropriate from lack of variety, and will produce sickness if solely used for any length of time. In our own field service they are intended only to piece out a notoriously rough and poor field ration. In time of war they are not to be used except upon rapid marches or just before or after battle when time does not permit of cooking, and the rapid movements keep back the regular ration. In such cases they are invaluable, but the return to the regular ration as soon as possible must be insisted upon.

SPECIAL USES OF PREPARED FOODS.

In the field in war times the transportation is usually insufficient. Officers of this military department know it and the subject receives constant attention throughout the world, for on it depends the success of the campaign. Notwithstanding all that is done, impediments will arise, break-downs occur, and roads become blocked. This always results in deficiency of food, for the rations in enormous quantities may be near by but unattainable, and the troops may be actually incapacitated for good fighting. This state of affairs may occur at any time and it is usually unavoidable. Again, in forced marches troops may be able to outstrip the wagon trains, and then they must carry their own food. Numerous field dietaries containing ordinary articles of diet have been suggested from time to time for those special conditions, but as they have had time to crystallize into some definite shape and have not done so, it is presumed that they are mostly impracticable. Reliance must be placed in some of the new prepared foods in such cases.

All these new foods are among the modern conditions which a military writer gives as affecting strategy, for let us see how much benefit these new foods can be in the way of permitting bodies of troops to cut loose from all supplies, as in the rapid movements to

get on the enemy's flank or rear. In the first place concentration of food can be carried to only a limited extent, because as already shown it is necessary for a man to have a certain amount of fuel in his food per day and a certain amount of material for repairs. Concentration only means the exclusion of the indigestible portions and part of the water. Thus the garrison ration gives to each man about five pounds of food, of which only four pounds are eaten, and it is impossible to condense this amount so that it will be much less than three pounds. All foods that are compressed and dried still contain from five to twelve per cent. of water. The German soldier's war ration is equivalent to about two pounds water-free food in the above sense. This is not enough for American soldiers during hard work, yet it is possible in an emergency to give the soldier fairly good nourishment with these improved foods, and not allow the weight to be over two pounds, as seen in the following table, in which the analyses are only approximate:

Articles.	GRAMMES.				Calories.	Weights.
	Proteins.	Fats.	Carbo- hydrates.	Salts.		
3 cubes dried compressed bread, $\frac{1}{4}$ lb. each.....	35	4	250	2	1233	$\frac{3}{4}$ lbs.
3 pkgs. compressed soup, 6 ounces each.....	100	150	200	28	2625	1 $\frac{1}{2}$ lbs.
3 tablets compressed tea or coffee ready for use, possibly a tablet of dried fruit.....						1 lbs.
Total.....	135	154	450	30	3858	2 lbs.
* Gross weight						

The composition of the bread is assumed to be the same as ordinary flour, and the tablets of soup can be manufactured of the given composition. As usually made, the tablets do not contain so much fat, which is here purposely increased in order to give the necessary energy. Even with this increase they would not contain as much as the first specimens of Erbswurst.

For purposes of detached service the U. S. soldier has been supplied, as seen in the following table:

Articles.	GRAMMES				Calories.	Weights.
	Proteins.	Fats.	Carbo- hydrates	Salts.		
1 lb. hard tack.....	50	5	340	21	1644	1 lb.
$\frac{1}{4}$ lb. bacon.....	27	236		8 $\frac{1}{2}$	2310	$\frac{1}{4}$ lb.
Coffee, sugar and salt.....				19		$\frac{1}{4}$ lb.
Total.....	77	241	340	30	3954	2 lbs.

These two dietaries have the same weight, and essentially the same potential energy, and their comparative values must be found in other characteristics.

It is not known how long a man can exist on the hard tack and bacon; surely he cannot retain his health very long, because scurvy and allied diseases will result. The protein (77) is insufficient for men doing hard work. This insufficiency alone will greatly reduce a man's vitality, so that he cannot stand fatigue nor the infliction of slight wounds.

During the Rebellion, when active operations were going on, soldiers were often required to keep four days' rations in their haversacks, but I have failed to discover what was the actual weight of food they packed away. The longest time any soldiers were entirely separated from the wagon trains was possibly five days (Chancellorsville). Five days' rations—ten pounds—is not much to carry, but it is possible that after much more than five days the men will suffer in health. No doubt men of great endurance could go for very much longer than ten days with such food and yet remain fairly active and strong; indeed, the North American Indian has so drilled himself that he can go as long as that with no food at all. We are to look at the endurance of the weaker soldiers, men weaker than the average, and we have already seen that the average is apt to be a very poor one.

In the above proposed ration the proteins are in almost double the amount of the bacon ration, and the fats and carbohydrates are more nearly in the proportions necessary in ordinary weather. In very cold weather the fats would have to be increased, but it is not likely that any military necessity in such weather will ever arise to separate many soldiers from their supplies; it can be safely assumed therefore that with this ration soldiers can exist for much longer than five days, and remain in fair condition. The actual time is of course impossible to determine, but it might be as long as three weeks, particularly if some of the digested foods to be mentioned could be carried along on pack-mules to revive men who show signs of tiring out. Put it down as low as ten days, and it can be readily imagined what a vast change that will make in the strategy of future wars. A commanding general constantly devises rapid military movements, necessitating detachment of bodies of men from supplies for the extreme limit of time possible. If he knows that he can safely detach a part of his army for ten days he can perform maneuvers now thought impossible, and if he devises a movement necessitating a detachment being without supplies for three weeks, he may

order it, even though he knows that one-half of the men will be more or less injured by the continued use of an insufficient ration. All this supposes that there will be methods of carrying along ammunition for such expeditions; but pack-mules can be used for that. The principles of defense will also have to be modified by these changes in methods of attack.

As to the weight carried by each man, it will not be too great for ten days—that is twenty pounds. In such cases soldiers throw away every single thing they can dispense with, knapsack, blanket and overcoat. In some cases they have retained only a piece of shelter tent and have been said to throw that away also, retaining nothing but haversack, canteen and ammunition. On the extraordinary occasion of being detached twenty days, they would have to start with the enormous weight of forty pounds of rations. It may be impracticable to do this, though it is possible to do it by throwing away knapsacks and all other articles that can possibly be dispensed with.

The total weight a soldier carries on his person when fully equipped for the field, including rifle and forty-five rounds ammunition, two days' rations, rubber blanket and shelter tent is about sixty-five pounds.

He may throw away and leave out—

	lbs.	ozs.
Overcoats.....	15	12
Blanket.....		
Blanket, rubber.....		
Shelter tent.....		
Clothing bag and contents.....	9 to 10	—
Contents of haversack.....	10	—
Total.....	35 lbs. nearly	

He will then have about thirty pounds total weight on his person, including rifle and ammunition, canteen, tin cup, and a bag for food. If he can load forty pounds on this he has a total of seventy pounds, which is about the weight of the equipment of the Belgian and Russian soldier, while it is less than that of the French (seventy-seven pounds). So we see that even if it is impracticable ordinarily, it can be made possible in extreme emergency, to detach men for twenty days. It will probably kill a few men, disable a few more, and greatly weaken a large number, but if they can accomplish the important object of their expedition, the loss may be insignificant in comparison with the results attained, and will be considered among the casualties of war.

Facility of packing and transportation is another point to be con-

sidered. The above special ration can be supplied in a paper package, either one ration, or better, in packages of one-half ration or one-third ration for two or three meals a day, and these can be packed in haversacks and knapsacks in a special contrivance. For a length of time more than ten days, the size of the bundles on a man's back would be enormously large, and would probably prevent the use of the ration for much greater time than this.

All this supposes that the soldiers are to be totally independent of the local resources of the country. As a matter of fact, the operations referred to are apt to be in settled localities and food will be procurable, and the amount available will of course determine the length of time the soldier can remain detached. The larger the body of troops to be fed, the more difficult it will be to find enough for them in the locality. Although small numbers, a regiment or two, may not be required to carry rations to speak of, large bodies, like a division or corps, may have to carry the full amount. The larger the number of soldiers, the more nearly will the length of time be governed by the amount of food carried along by each man. Pack mules if available, will of course lengthen the time, according to the number of animals. Each regiment of 1,000 men will require eight mules for each day's rations. We can throw out of consideration the raids of small parties of cavalry into an enemy's country for the purpose of destroying food and other supplies. Such parties cannot be hampered with any unnecessary weights on the horses. They must pick up their food as best they can. Other expeditions, like SHERMAN's march to the sea, are expected to live on the country.

Ordinarily the soldier would have tablets of appropriate size to fit snugly in the bottom of his haversack, and two to five days' supply will be packed away, and constantly carried. Stringent orders will be issued forbidding any one to touch the ration until it is impossible for him to get the regular supply of the ordinary fresh ration. They have been made in the cylindrical form, to be carried like cartridges, and each cartridge is enough for a good-sized cup of soup. All these prepared foods are particularly useful in the field service of our own troops on the frontier.

PARTIALLY DIGESTED FOODS.

The practitioner of medicine is brought in contact with still another variety of prepared foods, of vital importance to him in his treatment of the sick. The partially digested foods have been in such great demand that a large number of manufacturers are constantly turning out new varieties for trial. As a result of all this

elaboration, the foods are becoming quite numerous and excellent. Formerly an infant deprived of its natural food had a hard struggle for life, because it could not digest any of the mixtures prepared for it. There is now a great improvement on such a state of affairs, and the infant is given food which does fairly well, though it is not perfect by any means. In the same way invalids formerly died of sheer starvation, because they could not digest the foods they swallowed. But now the partially or entirely digested foods are given, absorbed at once, give strength, and make recovery possible. The foods may be mixtures containing ferments and digestive substances, that do the digestion in the stomach, or the foods may be actually digested, then dried by machinery, and when needed are mixed with water and eaten. Some of these will be carried along in future wars, and kept in the medicine wagons and ambulances. It is hoped that many a soldier who has become exhausted on the march will be picked up, revived and nourished by such foods, and after a good night's rest be ready for duty with the line. No doubt such means will save to the fighting strength scores or hundreds of men who in former times were sent to the rear in advances, or left to die in the roads during retreats. Again, such foods in the hands of nurses and agents of Red Cross societies may be the means of reviving the wounded after battle. It is known that thousands of these unfortunates die of an exhaustion that is entirely preventable. They are found dead after the battle, with wounds that should not have been fatal.

Some of these foods can be so prepared as to be ready for use after mixing with cold water, and without cooking. They might be useful accordingly in Indian warfare, when fires cannot be lighted on account of the danger of informing the Indians of the presence of the soldiers. The probability is that when these occasions arise, the prepared foods would not be obtainable.

The manufacture of foods has grown into an industry of such immense proportions and importance that it was possible last year to hold an exhibition of these alone in Madison Square Garden, New York. Nothing was on exhibition unless it had gone through some process of manufacture. It was unique, in that it was the first, and it succeeded in opening the eyes of the public to the rapid strides made by this new form of American enterprise. It is to be regretted that there is no available detailed report of the exhibition, for it is presumed that there must have been numerous articles that would make excellent military foods, but which have not yet been proposed for that purpose. We must be content, therefore, with the

original intention of this paper; that is, pointing out the principles to govern in the selection of the future ration of the soldier.

OBJECTIONS TO PREPARED FOODS.

The one great objection to prepared foods is the ease with which adulterations and other frauds can be perpetrated. Quality of foods can be easily determined if seen in the natural state, but let them be ground up and mixed with other things, and fraud may be difficult or impossible to detect. Good housekeepers will not buy with their eyes shut. The above objection applies far more forcibly to military foods; where the consumer is never the purchaser, the cupidity and avariciousness of contractors are greatly stimulated. It is a strange fact that though contractors know that at times the lives of the soldiers and the safety of the nation may depend on the character of the army supplies, they will yet jeopardize the lives of thousands of men by fraudulently supplying inferior articles. The disasters and sufferings during the Crimean War were increased to a great extent by the poor grade of supplies. The military history of the United States furnishes a host of illustrations of operations, and even campaigns, being hampered or even made disastrous by faulty food. The German government escaped this dilemma by making its own Erbswurst, and if any government makes its soldiers' arms, ammunition, clothing and shelter, it can surely make their food. The objection is lessened when it is remembered that prepared foods are not intended as a sole diet, but merely to piece out the notoriously rough field diet, and the objection may entirely disappear by an efficient system of analysis and inspection. Above all this it may be argued that if easily transported prepared, cooked foods are to be a valuable innovation, it might be justifiable to run the risk of being occasionally furnished with inferior grades, a risk that we run in the majority of mercantile transactions.

During the Civil War, it is stated that roasted and ground coffee was greatly objected to on account of adulteration, but it has also been stated that the adulteration was done openly, ground and roasted rye being purchased for the purpose. In regard to adulterated coffee, the writer has seen somewhere a statement that the average soldier prefers coffee that is adulterated with chicory.

Another objection to concentrated foods as a sole and continuous diet, is the fact that they do not furnish enough bulk of food. Though they may contain the proper amounts of energy and alimentary principles, they can never be used exclusively. But they are not intended to be so used except in emergencies and for short periods.

STIMULANTS.

In time of great fatigue, in forced marches before battle, etc., it is the custom in European armies to issue rations of wine or beer as stimulants for the depressed soldiers. Public sentiment may always prevent this among the English speaking nations. As a good substitute, extract of beef has been proposed. It is excellent for this purpose, and no army in the field can be considered completely supplied unless it carries along large quantities. It is prepared by numerous manufacturers in the United States, and the various grades now on the market are quite excellent. It consists chiefly of certain stimulating chemical substances found in fresh meat. It is not a food in the sense of giving any appreciable nourishment beyond the few grains of nitrogenous matter it contains. Beef tea has been said to have essentially the same chemical composition as urine. Spirits can never be used in the army as a regular issue; the practice is thoroughly vicious and was virtually abandoned sixty years ago. In extraordinary occasions of great fatigue they are allowable in moderation. Under such temporary stimulation the men will brace up and perform the necessary work of making earthworks, etc., when without it, they would be too exhausted to do anything. Without stimulation a man is not worth much after he has made a forced march of forty miles.

COOKING.

It need be scarcely mentioned that cooking must be as perfect as possible. It is a matter of common experience among all military surgeons, that poor cooking in the field is a most fruitful source of much sickness and actual disability, and even death itself. The greatest efficiency can be obtained from the soldier when his food is so well cooked that it can be properly digested. Nothing can be said on the subject of cooking in garrison, because there is no reason why the appliances should not be as perfect there as in any small hotel in civil life. It is in the field that difficulty is experienced, and always will be. Cooking appliances are always heavy and cumbersome in proportion to their efficiency. In private houses the best ones are fixtures of the building, the little cook stoves having been discarded long ago. At present, the field cooking outfit is simple and primitive in type for small commands, but for the larger commands of one or more regiments there are more or less efficient ovens and so on. The ration has always been so simple and unvaried, that it is possible to cook it fairly well with the simple appli-

ances carried along. We have seen why it will be feasible and actually necessary in the future to make the ration liberal, varied, and consisting of fresh articles. As a matter of fact, if these articles are to be properly cooked, they will require greater care and more intricate appliances than are now supplied. Here, then, is a subject for considerable thought, in relation to the future military food, and it is our duty to experiment with every new invention of field cooking appliance that the available transportation will permit of being carried along.

Though the frying pan is a recognized evil in civil life, wastes food by making much of it indigestible, causes dyspepsia and untold evils, and is a general all around nuisance to physicians, yet it is well nigh impossible to do without it in the army, particularly in the field. A trapper or frontiersman will cling to his frying pan as his dearest friend, and the soldier's fire indeed admits of only the simplest kind of cooking—frying and boiling. The evil in the field is not so great as would be supposed, for it is well known that outdoor life certainly increases the digestive powers to a most wonderful extent. The writer once knew an officer who was a confirmed, pessimistic dyspeptic, whose diet had to be almost as carefully selected as a child's, and whose illness was probably due to lack of exercise, for when he took the field and was compelled to do fatiguing work, he ate large quantities of fried food, dripping in grease, and not only was he comfortable, but he grew fat and was actually cheerful.

The matter of cooking bread is receiving attention in the French army. After much experimenting, they have perfected bakery wagons, so devised that the sponge can be made during the day, while on the march. For each army corps there are enough wagons, bakers and helpers to prepare 57,600 rations of bread in two days of thirty-six working hours or one and one-half day's supply, the balance being supplied from the base, or carried along as hard tack or the new compressed dried bread. It is recognized that the soldier in the field must have soft bread instead of the hard bread on which dependence is now placed. If the above appliances prove impracticable, reliance must be placed on immense bakeries at the base, and fresh bread forwarded daily to the front, as was once practiced in the Army of the Potomac. As for field ovens for baking alone, the U. S. army is already supplied with arrangements, which for simplicity and efficiency, leave little to be desired.

The new things that have been pointed out in this paper are of course not in contemplation by the U. S. army, and their absence should not occasion any particular alarm. There is no special neces-

sity of becoming hysterical over the fact. The country is not going to engage in a war in any great hurry, and experience shows that the practical American seldom bothers his brains about inventing a thing until there is a use for it. When the occasion arises, the inventor is generally on hand. There is a danger, nevertheless, and a great danger too, in the fact that being unprepared for war involves a delay when the time does come—a delay that might turn out to be quite disastrous.

In this paper are many extracts from an article by the writer on the "U. S. Ration," published in *The Journal of the American Medical Association*, December 3, 1902, in which will be found the authorities for many statements here made.

TRADITION AND DRILL REGULATIONS.

BY CAPTAIN W. H. CARTER, SIXTH CAVALRY.

IN that era of our nation's existence, now happily past, when millions were freely spent in petty wars that civilization might pierce the Indian barrier on our frontiers, the necessities of each occasion developed men capable of handling the grave questions to be solved. The changed conditions which now confront us are such as American officers have not heretofore had to face. They require careful consideration, continued experiment, and a willingness to accept improvements, but not alterations merely for the sake of change.

Without the possibility of applying the crucial and only true test of service and war to proposed modifications, radical changes should never be made without apprehensions as to the result.

There has been a growing tendency on the part of officers to study foreign systems, which is entirely creditable to them; but in making application of European ideas, let us not allow a quarter of a century to dim the glorious memory of our cavalry divisions which so conspicuously aided in closing the Rebellion.

We have profited much by a study of the difficulties which surrounded the patriotic gentlemen controlling the affairs of the government in 1861. The grave question for the present generation is, are we so conducting our affairs and our studies, that in event of any call being made upon us, we could give a better account of ourselves than did the noble generation now so rapidly passing away?

The poor results, after such enormous expenditure for cavalry in the early years of the war, bring strongly the conviction that the organization, use and power of cavalry were but little understood at that time. The loss of horses was enormous, and in every sense wasteful, without adequate return in successful service. But later on, after varied and often humiliating experiences, the trick was

learned by a few masters, who led the hitherto despised Yankee squadrons from one successful field to another, with marked rapidity.

The present generation, however, has a very just complaint against the successful generals of the war, for the few who have left us memoirs have dealt too much in glittering generalities, and too little in the details of service and tactics used on the field of battle. The blunders, the happy accidents, the defeats, and glorious victories of the War of the Rebellion cover the pages of history most worthy of the young American officer's study.

Our cavalry then settled for us a few things which Europe has had under consideration ever since. We cannot afford to put aside our experience in favor of any foreign theories. England is still discussing the advisability of changing from double to single rank. We have no doubts on that subject. The German cavalry has resumed the lance, but we know too well the value of fighting on foot to hamper ourselves with such a weapon. Our young men discuss periodically the relative value of pistol and saber, but are too wise and conservative to think of casting aside the combination of arms that enabled the cavalry corps to become a "stem-winder" to LEE's army in 1865, when this ubiquitous body faced the Confederate horsemen at every turn with sabers, and were found behind logs and fences with carbines by every division of infantry which attempted to lead the way for the retreat.

We are forced to admit that in the past we have not achieved all that the drill books have demanded of us. Completeness is what is lacking, and but little real progressive instruction is given; so that efficiency of all the men in any one thing is hardly regarded as possible. Failure to accomplish more is not chargeable to want of time, or lack of enthusiasm on the part of troop commanders. Much of the unsatisfactory condition which faces us is due to the fact that the maintenance of a lot of frontier villages—misnamed forts—falls to the lot of cavalry commands. So heavy is the weight of this responsibility at times that at one post where the writer was engaged with a number of other troop commanders in teaching the new drill regulations, an order was issued directing all the troops to be brought in close to the quarters before recall from drill was sounded. The troops would be promptly dismissed, and troop commanders held responsible that extra-duty men were not delayed in reporting for work. The quartermaster selected the men under him to attend drill on certain days, without regard to the character of instruction being carried on at the time. There were no special reasons for this action which do not apply equally to all cavalry

posts on the frontier. The troops are reduced for drill to mere squads or platoons.

The skeletonizing and readjusting of four years ago, fell more blighting upon the cavalry than is generally supposed. The orders disbanding two troops were followed by one reducing the number of men to sixty per troop, and without any further order or law on the subject being published, the number of men supplied to each troop through recruiting depots has been fixed at fifty-five. The result is, that troops habitually turn out for drill with two platoons of twelve men each, with occasionally sixteen men in one platoon.

The result of this, taken in connection with lineal promotion, and the temptations put before lieutenants to seek detached service of all kinds in preference to legitimate military duty, has been to eliminate much of the old time enthusiasm the younger element was wont to have for the troop and regiment. There is none of the old excitement attaching to frequent field service, and young blood does not thrive on tradition alone.

When the new drill regulations were published, the cavalry arm received them without prejudice, and went to work with the means at hand to learn them. We have now worked with a hearty good will for two years, and with some alterations in the line of simplicity, the cavalry will be entirely satisfied.

The application of the squad system to mounted work has not commended itself as applicable to our service. We must face the fact that our troops are never large, and a platoon of sixteen men is as small a unit as could well be effective on any line of battle. It is not intended to write a criticism of the drill regulations, for a competent board is now in session revising them. The squad system is mentioned, because that was the principal innovation in the new as compared to the old drill. The placing of corporals in command instead of tried and experienced sergeants, failed to develop that efficiency which was expected under the old systems.

It is a well merited compliment to the board which formulated the new system, that fewer decisions were required to make clear the meaning of the text, than in the case of any drill book heretofore issued. The gravity of the duty of preparing drill regulations, and the labor attaching to it, are not always appreciated by those who criticize. It is not always a question of what is best, but what is most expedient and applicable.

Many writers have run riot in demanding that nothing shall be drilled but what is clearly useful on the field of battle. Let us

avoid these extremists. We are wont to descant upon the decadence of discipline in these degenerate days, and conservative men who are not blind to the fact that we have splendid material in the ranks, believe that the traditional methods of instilling and maintaining discipline by exactitude of close order drill on the parade, is just as desirable as ever. This same element demands for the skirmish drill the utmost simplicity.

Every man in so expensive a branch of the service as cavalry, should be thoroughly and progressively drilled, until familiar with every duty. The only way to accomplish this in our service, is to adopt a system similar to that now in use at many posts for target practice, in which part of the garrison performs all guard, police and other routine duties, and the other part attends strictly to target practice. Two weeks drill in the spring, and a month in the autumn, after target practice, with every man in ranks, would give better results than is possible under present methods.

Personally, I regard the signal drills daily, requiring four men from each troop, and the litter drills, as conducted, farces, and of doubtful utility under any but most exceptional circumstances. It would be infinitely better to have the whole troop instructed for a week or ten days in litter drill, and the non-commissioned officers in first aid to the injured, than to keep up the drill as now carried on.

I recently witnessed a litter drill by the detachment of the hospital corps at Fort Leavenworth. While a supposititious patient was being placed upon the litter by four men, apparently "by the numbers," the assistant surgeon stood by with drawn sword, and the hospital steward with drawn saber. Such example as this is not fit to be put before soldiers of experience. A cavalryman leaves his saber on his horse, in order to attend to his duty on foot in a common-sense way, and such sights as that witnessed by me is not calculated to increase respect for hospital corps methods, or cause any enthusiasm on the part of cavalrymen detailed to take the course in addition to their other duty.

If we compare the recruits furnished us through the depots with the gangs of toughs sent out for some years after the Rebellion, any but the most prejudiced will admit the equality, if not superiority, of the material at present. Furthermore, if we compare the men we get from foreign services with our own, it makes us realize we have no cause for shame. All we want is a fair, common-sense plan to prepare these men to be the finest, as they are the most intelligent, soldiers in the world.

AN ARMY UNIFORM.

BY CAPTAIN H. F. KENDALL, EIGHTH CAVALRY.

A UNIFORM should possess the following qualities: It should be durable; it should afford the wearer protection from the weather; it should be made in such style as to furnish the wearer the fullest use of his physical faculties; it should be *uniform* and distinctive, at least in each corps; it should be neat and attractive, without being conspicuous. I was going to add that it should be soldierly, but any uniform filling these conditions would be most soldierly.

On the other hand, the eye and the mind stand in such relation to each other that any garb habitually worn by those who follow the profession of arms we soon get to regard as soldierly, in the narrower sense, however preposterous or unsuitable it may be. The grenadier and zouave, however dissimilar, are nevertheless soldiers, and their uniforms we readily concede as being those of soldiers.

The uniform should fulfill all of the foregoing conditions, and no others. The duty of the soldier is, in times of war, to march and to fight, to perform the fatigue work necessary for security and sanitation; in times of peace to maintain a state of preparedness for the higher duties of war, under conditions as closely similar to war as circumstances will permit. His clothing should therefore be adapted for such work, and for nothing else.

Turning to our own uniform, before proceeding to details I will state that the present color is open to but few trifling objections: but even if they were far greater, popular sentiment and historical association would demand that the blue remain unchanged.

Beginning with the head, we have the forage cap, the helmet and the campaign hat. The two former offer us object lessons in the military supremacy of the two leading nations of Europe, which

is just about the limit of their utility. The campaign hat covers and protects the head, shades the eye, sheds water so that it falls beyond the limit of the coat collar, and while lacking the nobbiness of the forage cap, is sufficiently neat and attractive. Nothing more could be desired. This certainly is the office of a head gear, and the cap and helmet do neither. The Adjutant-General's Department has issued to the soldier a hand-book, presumably containing a consensus of the most valuable opinions on all matters pertaining to his career. In this book he is earnestly counseled never to sit on the ground, but rather to sit on his hat. The forage cap does not present a sufficient superficial area; the helmet, offering the same objections, has the additional one of defective organic structure. None of these obtain in the campaign hat, and although I would advise the soldier to keep on his hat and trust to the seat of his trousers, still, if we must use our hat as a seat, let it be one that answers the purpose. This uniform hat, made of better material, of some regular shade of drab or dark blue, with a device denoting the organization to which the man belongs, would fulfill all conditions desired, and should be adopted as the only head gear of our army for all duty except in extreme weather, when hoods or fur caps should be allowed.

As regards coats, we have the dress coat and the blouse. The former will be noticed farther on. The blouse, a single-breasted sack coat of dark blue, is singularly well adapted for a uniform coat. It possesses every feature that could properly be desired, and should be adopted for the army as the only coat to be worn on all occasions. They should be made in two grades, one heavier than the other, for wear at different seasons. In hot weather, on duty other than ceremonies, the blouse should be dispensed with and the blue flannel shirt worn.

Trousers should be made ankle length and close fitting at the bottom, with buttons or hooks so that they may be removed without taking off the shoe. They should be made in two grades, one heavy and one light, of blue kersey, similar to the material issued about ten years ago. This was attractive and very durable, both in color and texture. The present cloth is far inferior in all respects. No reinforce for mounted troops is needed. They make the garment heavy and bulky where it is least required, and only add to the expense. The reinforce wears out a little sooner than the single thickness would, and then has to be patched, making three thicknesses of cloth under the seat. The ordinary trousers can be patched

when needed, and will outlast, looking better and being more comfortable than, the present ones.

The foot gear of all troops should consist of a laced ankle shoe, perfect in material and workmanship, made in a sufficient number of widths and sizes to fit any foot that would be accepted in the recruit. There is no article of apparel in which personal fancy varies so much, and the selection of which, by individuals, betrays so much stupidity as the covering for the foot. Personal vanity in this direction seems to be so potent that men will, if left to themselves, wear shoes, in spite of their better sense, which would soon become worthless, or so cripple the wearer as to make him so. It is important, therefore, that a thoroughly good shoe should be adopted, and being adopted, its wear insisted on. With such a shoe should be worn on all duty, except fatigue, by foot troops, a short legging or gaiter, and all mounted troops a knee legging. Whether these leggings are made of canvas or leather, are russet or black, buckled, buttoned or fastened with springs, are matters of detail only—the worst being better than the boot now worn. I have given the matter of foot-wear a most thorough test, both mounted and on foot, and know that the shoe with legging is so far superior to the boot, that it is surprising the latter has so long been adhered to.

Gauntlets should be abolished and a good, substantial buck glove of some neutral tint substituted. It would be well if these were made uniform throughout the army for all occasions; but the gauntlet should certainly be done away with. It is, like the boot, a survival of times and manners that we are well rid of. The blue overcoat should remain unchanged. The cape should be detachable, and should be lined with blue or grey. Nothing could be more absurd than the brilliantly colored linings now seen. They serve no useful purpose whatever, while they add to the expense of the coat and the difficulty of keeping it clean. They make the wearer unnecessarily conspicuous, easily seen and recognized at a distance, and a good target for an enemy. On the score of utility or necessity, these gay colors are utterly indefensible, and this alone should certainly condemn them.

For all mounted troops, an oiled coat, like the pommel slicker, should be issued. They are perfectly waterproof, will stand any climate, which the rubber poncho will not, and they completely protect, not only the wearer, but his saddle and pack, incidentally keeping dry the horse's back and loins—a very important item. In lieu of the bright yellow color now generally used they should be of a neutral blue gray. This shade could be obtained by laying

the oil on a coat made of strong blue jeans. This would render it less conspicuous and would not show the dirt and mud that necessarily get on garments of this kind. I know of no more perfect rain coat for horsemen than the pommel slicker, and it is surprising that the rubber poncho should have so long been supplied. For foot troops, inasmuch as the skirts of the slicker would impede their march, and as their feet and legs must of necessity become more or less wet, the slicker would not answer. A garment made like the poncho, but of similar material to the slicker, should be furnished: this would keep dry and protect the body, and being worn over the kit, would protect it also. The slit through which the neck passes should be provided with a collar and made to button closely after being put on.

For extreme cold weather we have had the buffalo coat, but its day has passed; the necessity for a substitute has been met, however, by the Mackinaw, or blanket lined canvas coat now issued. This is an excellent material. The canvas should be heavy and practically waterproof, and the lining all wool and loosely but well woven. Clothing made of this cloth is peculiarly well fitted for our climate, where sudden changes are the rule and a rain storm frequently precedes or follows an excessively cold spell; in this respect, although lacking the absolute warmth of the fur, it is far superior to the buffalo coat. Being made with the woolly side in, it is impervious to moisture. Its make up is, however, defective. The long skirted coat cannot be worn mounted and is in the way of the footman. Cavalry men marching in the face of a cold wind, parting the skirts of the coat to protect the knees and thighs, leaves a gap in front where the cold strikes on the pit of the stomach, causing discomfort and sickness. Then, the coat works up on the saddle behind and uncovers the legs. The same material should be used, but should be made into a short coat, with high, rolling collar. The sleeves to close well down on the wrists, and the coat to fasten either with buckles and straps or else frogs and loops. It should be double breasted and made with inclined pockets large enough to easily admit the full gloved hand. In addition to this coat, there should be made, of similar cloth, overalls, full regular made in front, but cut out at the seat. This would prevent bunchiness in the saddle, the fleshy part of the buttocks requiring but little protection, and by closing in front the lower part of the body would be fully shielded. There would be no coat skirts to incommode the wearer and but little, if any, additional weight, the cloth to make the overalls coming from the amount now used in the skirts. With such a suit, with

fur cap and thick woolen mittens worn over the glove, the feet covered with German or felt socks and arctic shoes, we could defy any weather, however cold, and a winter march would be shorn of all its discomforts, while the men would be so little hampered by their clothes that they would retain largely their powers of action. The brown canvas fatigue clothing should continue to be issued, but should be rigidly restricted to fatigue work only, and its present frequent wear when not on duty severely discountenanced.

For stable duty I would retain the present white clothing: it thoroughly protects the soldier's uniform from dust and dirt, and by its color indicates to the troop commander that it needs the attention of the laundress in those cases when the personal pride of the wearer fails to make him change.

This completes the soldier's uniform for all duties and for all seasons. It is all that he needs and it is also all that he wants. For ordinary wear, when not on duty, white collars and cuffs should be supplied, also full length trousers similar to those now issued.

To sum up: he has a good, serviceable hat, a neat fitting coat and trousers, with leggings and comfortable shoes; he has a good overcoat, a rain coat that will keep him dry, and for extreme cold weather suitable garments which, in protecting him, give him the full use of his arms. Chevrons and stripes of present pattern should remain unchanged. For entertainments, balls, and at all times when off duty or on pass, his uniform is the same as that now worn, except that the forage cap has been replaced entirely by the hat. The whole question of administration has been simplified and the cost of the clothing materially reduced.

The uniform for officers should conform in general to that of the enlisted men. It might be of finer material and more careful makeup to accord with the better means of the wearer. Trousers of full length being habitually worn, and the present boot for mounted officers authorized for ordinary garrison duty. The shoulder strap to be retained. It is more than ever important that the officer should wear some mark of office, particularly in action, which can be plainly and readily recognized by the soldier; this the shoulder strap does as well or better than any device which might be designed. It has been objected by some that they make the officer too easily recognized and marked down by the enemy; to such it may be urged that modern combats will rarely be pushed to the limits within which the shoulder strap can be seen, and when within such limits it becomes more than ever important that the officer's presence should be clearly manifest. The objection after all is trifling, but to those who insist

I can only advise that they had better, like PERSEUS of old, go to the Nymphs and get from them the helmet of invisibility, or else seek security by a timely resignation.

The full dress uniform, so-called, should be entirely abolished; if it ever had a purpose that purpose has been served. It is neither needed nor wanted by the army. The commander in chief of the British army, before a parliamentary committee on this subject, recently stated, in response to the question as to the necessity for the brilliant uniform, in substance if not in words, that MARY ANN liked the bright uniform and that TOMMY ATKINS liked MARY ANN; that, with a voluntary system of recruitment and without such an inducement, the ranks could not be kept filled. This answer recognized, as it were, the fallacy of such a uniform, but gave fair reasons for its continuance. Such reasons do not obtain in our army, but the fallacy remains. The Duke of Cambridge's remarks, good in themselves, are in striking contrast with an article, endorsed by a high ranking officer, which recently appeared in one of the leading New York papers, in which this officer not only insulted a brave body of troops but betrayed great ignorance of the military regulations of the second State of this Union. Some of the Pennsylvania National Guards, just returned from the labor troubles at Homestead, appeared at the Columbian parade in New York City in their regular uniform, or what we of the national forces, less progressive than the State of Pennsylvania, designate as undress or rather marching order. The people, then present, recognized these men as soldiers in the highest sense of the word and applauded them to the skies, an applause shared by only one other organization, which also appeared in simple yet eminently suitable uniform: the blue jackets from the warships in the harbor. The others in the procession, in garb manifestly unfit for any duty, were allowed to pass in silence, some few instances excepted, when the personal popularity of the organizations redeemed them from their preposterous costumes. The reasons given for the tirade against these troops was, in short, that they had committed a breach of etiquette (measuring their rule by that of the city club man) as if any uniform could be more appropriate for soldiers to honor a hero or an event (I quote from the article) than the one in which they would fight their country's battles, the one in which they may in future be called upon to celebrate. I need waste no more time on this officer's strictures, which seem as little merited as they were liberally bestowed. The whole episode would be of no value did it not show us why we are encumbered with our grotesque full dress: that a soldier should have one uniform to be a soldier

in, and another in which to play at soldiering. One more lesson it teaches us: that the American people also honor and respect the service uniform.

We have no MARY ANN and we have no TOMMY ATKINS. Our full dress catches no recruits. We wish for no men who would be caught by its absurdities. The number of good soldiers kept out of the army because of it is greater than that of the indifferent recruits attracted by it. It is never worn except by order, and then with manifest dislike; the individual soldier takes no pride in it, but he does in his blouse and trousers. The full dress coat is worn ill-fitting and grotesque, as it is drawn from the quartermaster.

I will defy the world to produce a finer looking soldier than a well set up infantryman in the United States army, in neat fitting blouse and trousers, campaign hat and gaiters, his leathers well blacked and brasses polished; he looks what he is, a man and a soldier, fit for any duty; adorning his uniform rather than being adorned by it. The same could be said of our cavalryman: he is marred only by his heavy boots; but what a contrast when they appear in full dress?

When I was at West Point, we studied a text book which said that "the soldier going into battle should put on his full dress, it was an honor due to a brave foe." This book, written by one who, it may be needless to add, had acquired his martial ardor in the peaceful days which followed in Europe, the Napoleonic tragedy, absurd as it was, was based on conditions which do not now exist. Formerly, the soldier had but one coat, which was his uniform coat, a fact which still lives in our present nomenclature when the full dress is called *the uniform coat*. Better sense has prevailed, and the fatigue coat or blouse has in fact, if not in name, become the uniform coat, and the full dress, no longer used for ordinary wear, has been driven from the battle field and the drill ground, and is now only worn on occasions of ceremony. Let us hope that it will also soon be driven from these, and no longer find a place in our clothing allowance. The ceremonies themselves are of no value, except for the possible military instruction imparted by them. This purpose could be better served if the soldier entered on them in the fatigue uniform, so called, or the one in which he would put the information so gained to a practical test.

THE BATTLE OF ANGOSTURA (BUENA VISTA).

TRANSLATED FROM THE SPANISH OF MANUEL BALBOTIN,*

BY CAPTAIN F. H. HARDIE, THIRD CAVALRY.

SUMMARY.

HEADQUARTERS SAN LUIS POTOSI.—ARRIVAL OF GENERAL SANTA-ANNA.—CONCENTRATION OF FORCES.—CONTINGENTS OF THE STATES.—THE BAD IMPRESSION MADE ON THE ARMY BY THE PUBLICATION OF ARTICLES AGAINST IT BY THE PRESS OF THE CAPITAL.—GREAT SCARCITY OF RESOURCES IN ORDER TO CARRY ON THE WAR.—FORCES OF THE STATE OF SAN LUIS.—REVOLUTION OF GENERAL SANTA-ANNA.—MARCH OF THE ARMY.—STRUGGLE WITH THE ELEMENTS.—CONCENTRATION OF THE TROOPS AT THE HACIENDA OF THE ENCARNACION.—MARCH UPON AGUANUEVA.—COMBAT OF THE 22D AND BATTLE OF THE 23D OF FEBRUARY.—THE RETREAT.—MISFORTUNES OF THE ARMY.—THE RETURN TO SAN LUIS POTOSI.—OBSERVATIONS.

EARLY in October, 1846, General SANTA-ANNA arrived in San Luis Potosi with the greater part of the military forces which were in the interior of the Republic, and established his headquarters. Thereupon he ordered the division that had evacuated Monterey and was now at Saltillo to fall back to San Luis—a most unnecessary disposition, because, in the first place, there was a seven weeks suspension of hostilities, and therefore there could be no fear of a conflict; in the second place, because the presence of the troops in Saltillo would rouse the people of the States of Coahuila, Nueva Leon and Tamaulipas to form guerrillas, harass the enemy and interrupt his line of communication with the Rio Grande. It would have been better that the forces that were forming in the camp at San Luis Potosi should not have been required to make a retrograde movement, but much more advisable to have advanced them to aid those who found themselves in front of the enemy.

* Formerly a sub-lieutenant of artillery in the Mexican army, 1847; now, 1893, a colonel of artillery, retired.

Moreover, in case of the termination of the armistice, should it have been agreed to withdraw that advanced guard, it could easily have retired upon Matehuala, and from there it would serve as a support and refuge for the guerrillos who would be harassing the Americans, and would cover at the same time the City of San Luis.

Another disposition of General SANTA-ANNA was the evacuation of the Post of Tampico. It was not indeed prudent to leave a garrison isolated at such a great distance, but the manner in which the evacuation was accomplished is without doubt censurable. Without necessity, he did this with great precipitation. He did not carry into the country the material of war before abandoning the post. Neither did he arm the people with the implements that were there; and when the nation cried out for these things, they threw into the river, without compunction, cannon, arms and munitions. That this was done by order of General SANTA-ANNA, I am induced to believe, but General PANODI, who commanded the place, should not have obeyed the order.

There arrived in San Luis, within a few days of each other, the forces from Saltillo and Tampico, and two States of the federation remained in the hands of the enemy. From this moment they took into consideration the fortification of the City of San Luis. On the north and west of the city were commenced works of small capacity, in the plowed ground, full of trees, and constructions that could not be quickly destroyed, in order to obtain open ground the better to fire and to take away shelter from the enemy. At the Sanctuary of Guadeloupe was commenced a more formal work. It was a closed fort, with bastions and demi-lunes, which formed a regular pentagon. Although much work was done, it was not brought to a conclusion.

The troops were exercised frequently; the infantry by brigades under their generals, but never was seen a general exercise, not, at least, of a division. The cavalry maneuvered only by regiments. The General-in-Chief did not present himself during the instruction, even by chance, and could not appreciate the respective worth of the troops under his command. Sundays the troops went to mass, then took a turn about the city and then went to their quarters.

There was no council of the superior officers in order to confer in regard to the operations of the campaign, nor had any plan of operations been projected; nevertheless, there was in all corps, as there should have been, schools for officers.

During the months of November and December there arrived substitutes for the army. There also arrived the troops raised in the States of Guanajuato and Jalisco. These troops were generally

badly armed; in bodies among them could be seen arms of all kinds; and the greater part had no bayonets: there were noticed many guns good for nothing, with leather thongs or cords in place of bands. Among the troops from Jalisco were found those raised in the last revolution. In general, all were badly dressed and equipped, especially those from Guadalajara.

As to their instruction, it was completely elementary. Recruits composed the greater part of the contingents raised by the States; no care was taken to give them the slightest instruction in firing, and for this reason many soldiers were to fight without ever having fired a gun.

Among the defects of the General-in-Chief was one which produced the greatest evil; that was the preference and protection shown to certain bodies of troops to the detriment of others. The regiment of hussars, with its high pay and numerous officers, consumed much more of this kind of levy than the others. In order to keep up its full strength they placed in it small bodies of the men raised in Guadalajara at the time of the Pronunciamiento, with this result, that this body which had distinguished itself by its exclusiveness, received in its lap officers inferior beyond all conception. In the infantry the battalions First, Third and Fourth Light and Eleventh of the line, were protected.

The sappers and miners, Second Light (infantry) and First, Second, Third, Fourth, Fifth, Tenth and Twelfth of the line, were small in size and poorly equipped. The actives of Mexico, of Querétaro, of San Luis, of Aguascalientes and of Morelia, found themselves in the same condition. The auxiliaries of Guanajuato, of Leon, of Celaya and of Guadalajara, although in goodly numbers, were as badly off, with a poor armament, especially the first three. There arrived also some bodies of cavalry, "Volunteers of Bajío," but as will be seen hereafter they were no credit to anybody.

In the middle of November was terminated the armistice, which was made at the capitulation of Monterey; the event was celebrated by music at reveille and retreat in front of the house of the Commander-in-Chief. The order of the day was a sort of proclamation to the troops. General SANTA-ANNA ordered that a division under the command of General D. GABRIEL VALENCIA should occupy Sierra de Tula, which was said to be fortified. General SANTA-ANNA reviewed the troops on the plain of Guadeloupe. The division was composed of the Battalion No. 12, Battalion Fijo de Mexico, Battalion Guardia Costa, and the veteran company of Tampico, the squadron of San Luis, and the volunteer cavalry of Guanajuato;

in all 2,000 men, three cannons, eight-pounders. Shortly after this force occupied Sierra, an American division, commanded by General QUITMAN, proceeded from Monterey via Victoria in order to embark at Tampico. In passing by the springs of the Sierra the march of the Americans was prolonged and disordered, owing to the narrowness of the way and to the weak condition of the men, and it is even said that many of the soldiers were drunk.

It appears that the inhabitants of Victoria and other places of Tamaulipas offered to fight the Americans if the troops would attack them. At the sight of the enemy everything was in readiness in the section commanded by General D. MANUEL ROMERO. It is said that just at this moment General VALENCIA received a positive order from the General-in-Chief prohibiting, under the strictest responsibility, any action which would bring on a fight. The Americans followed the road without molestation, the people remained grief-stricken and disconsolate, and the troops were profoundly disgusted. The volunteers of Guanajuato disbanded entirely.

This act caused much sad reflection. For what reason was a division placed in the Sierra if not to fight the enemy? What harm could have resulted from an engagement with the Americans, even if the troops should have gotten the worst of it? Or was it that General SANTA-ANNA did not wish to allow another general to acquire the glory of a triumph?

The immediate result of this affair was the loss of the cavalry of the Bajío, and the separation from the united command of General VALENCIA, leaving at the head of the division the General of Brigade, CINIACO VAZQUEZ.

At the end of the year 1847 the situation of the army was as follows: In Tula or Tamaulipas, the division of General VAZQUEZ. Two or three battalions of small strength and the greater part of the cavalry occupied Bocos El Venado, Matchuala, El Cedral and San Juan Venagas. The headquarters, with the greater part of the infantry and the regiment of hussars, were in the San Luis Potosi.

It cannot be denied that the State of San Luis Potosi distinguished herself by her patriotism and services in this war. She had aided the army with money, and by the blood of her sons, and the people had supplied provisions for the army, and worked themselves personally for their welfare. Notwithstanding this, the Republic did not heed the patriotic fire, the enthusiasm of a people who rose *en masse* to defend their homes.

The aspect of the city was tranquil, and had it not been for the presence of the troops, which gave it a certain martial appearance,

one would not have believed that the nation was engaged in a just war against the strangers that invaded it. The Army of the North was badly paid, as was natural, taking into consideration the penury of the treasury. It had no other preparation for the campaign than the construction of munitions and the repair of material of war; nevertheless they were storing provisions in the districts in which the army would operate. There were no hospital ambulances, without which no army can march; nor could they think of tents, made necessary by the rigorous winter, for these the Mexican army had never been used to. It would take weeks, if not months, to have all the things necessary to perfect the organization of troops arriving from so many different directions, many of them being hastily levied.

For the reasons given above, the putting in motion of these masses, so poorly prepared, should not have been thought of; but unfortunately, the General-in-Chief did not have the liberty of action that was necessary. The Government, impelled by popular opinion, which was impatient for active operations, without calculating the difficulties to be surmounted, exercised constant pressure on the General in order to hasten the campaign. The press, without foreseeing the consequences of its imprudent conduct, exasperated by the inaction of the army, loaded it with contemptuous reproach, painting San Luis as a new Capua, where the military giving themselves up to pleasure, were consuming the wealth of the nation, and forgetting completely the cause of the country. Each mail that arrived from the Capital produced in the army an explosion of disgust.

The newspaper called *Don Simplicio*, on account of its jocose and cynical character, was the one that most wounded the feelings of the military. These writers, forgetting that the Mexican Government never had the ability to organize and to attend to an army; that our soldiers were always badly paid, badly fed and badly clothed; that in San Luis was found the remains of the Army of the North, which had guarded our frontier for more than ten years, fighting constantly, now with barbarous Indians, now with the Texans, without receiving, since when the Lord only knows, even the smallest part of their dues; that the chiefs, officers and troops had to work personally in order to furnish the food; but inspired by the sound of the call to arms, now to fight, now to make expeditions through the desert, without wages, without more rations than one could carry in their pockets, they did their duty nobly.

At best it was necessary to assure these unfortunate soldiers that if they did not obtain victory it was certainly not their fault, since

they were obliged to fight under so many disadvantages. They became more demoralized by these writers who prejudiced public opinion against them; but finally there came such a degree of exaltation that nothing was thought of but marching. They did not take notice of the lack of important things; that they needed rations and money. They wished to close with the enemy, and whether conquered or conquerors, they would show the nation, by shedding their blood, that the Mexican soldiers did not merit the censures that were heaped upon them.

The General-in-Chief, who also came in for his share of the indignation of the people, was anxiously endeavoring to put an end to a situation so trying. He pledged his own credit to borrow money, in order that the army could be put in condition to march.

By this time word was received that General DON JOSÉ VICENTE MIÑON, who commanded a brigade of cavalry, had captured, at the Hacienda de la Encarnacion, two field officers, four other officers, and seventy men of the enemy's troops. It is also said that another party of the enemy who had entered the Cañon of Santa Rosa, had been destroyed by the inhabitants.

Jan. 26th.—The order has been given putting the army in motion. Half pay was distributed to the General, chiefs and officers, and baggage was prohibited. It is enough to say, that the half pay of a sub-lieutenant of infantry was eighteen dollars, which will show plainly to what privations the subaltern officers were subjected.

Jan. 27th.—There set out on the march: The battalion of sappers and miners, three companies of foot artillery, the company of Irish volunteers, escorting three iron twenty-four-pounder cannon, on wagons; three single pieces, sixteen-pounders, mounted; one seven-inch field mortar; five field pieces, twelve-pounders: two field cannon, eight-pounders, making a total of fourteen pieces, which, united with the three field pieces which were with the division of TULA, made seventeen pieces of artillery, which number was entirely too small for sixteen thousand men. Calculating three pieces of artillery for each thousand men of infantry and four for each thousand cavalry, there would be needed for the army, for—

12,000 infantry.....	36 pieces.
4,000 cavalry	16 pieces.
Total.....	52 pieces.

The fifty-two pieces should have been light field pieces, on account of being easy to transport, although the park of siege artillery, to which park belonged the twenty-four and sixteen-pounders, might

have been found useful in the remote case of the enemy being shut up or surrounded in a village.

To resume: The army had no more than eleven field pieces; that is to say, less than a field piece for each thousand men. It is a well known fact, that the more inferior the troops are in quality, the greater necessity is there for a greater number of cannon to support them. Unfortunately, our army was composed in great part of men who were entirely inexperienced in war, while it was well known that the Americans were strong in artillery, and notwithstanding this consideration, it appears that we had the temerity to carry little.

San Luis certainly did not lack light cannon to form two or three batteries, nor troops to serve them: there were more than enough people in the first brigade of the army for this purpose, in addition to two batteries of horse artillery, which, unhappily, were detailed as a guard for the general park, with the exception of two platoons, serving two eight-pounders, commanded by Captain D. IGNACIO BALLASTA. As a last resort, the Irish volunteers could have been used, because they had been exercised already in the service of the pieces. It is incredible that so many blunders, contributing so much to the bad result of the campaign, could have been committed. The lack of field artillery was soon seriously felt.

Jan. 28th and 29th.—The Fifth Brigade of Infantry, under command of General D. FRANCISCO PACHECO, departed; January 30th, the First and Second Brigades of Infantry, composed of eight battalions of the best troops, commanded by Generals D. JOSÉ CONDÉ and D. FRANCISCO PEREZ, set out; January 31st, the Twenty-second and Third Brigades, under the command of General D. LUIS GUZMAN, took up their march; they were composed of eight battalions, with the exception of the Fourth of the line; the "Actives" of Mexico and Aguascalientes were formed of raw, undisciplined troops.

Feb. 1st.—No movement.

Feb. 2d.—General SANTA-ANNA, with his aides, chief of staff, and the commanding generals of artillery and engineers, and the chief of the Medical Corps, etc., set out, escorted by the regiment of hussars. Although it had been ordered that no baggage should be taken, just the same as with the minor chiefs and officials, nevertheless they not only took all they could, but also pack mules loaded with provisions. This first journey was made by traveling the greater part of the night, and they slept at the Hacienda de Bocas.

Feb. 3d.—From Bocas to Vernado; on the road, we meet the seventy Americans made prisoners at the Encarnacion on the 23d

of the month before. It rained all day and consequently we arrived at the Vernado drenched.

Feb. 4th.—From the Vernado through Charcos to Laguna Seca. Rained all day; on the march met twenty-nine Americans, who were made prisoners by General MISON.

Feb. 5th.—To the Ranchos de la Punta, through the Haciendas de Solis and the Represadiro. General SANTA-ANNA continued on as far as Hacienda de la Presa. The retinue passed the night in la Punta.

Feb. 6th.—To Matehuala, leaving to the left the Hacienda de la Presa. The brigades that were at Matehuala continued their march forward.

Feb. 7th.—To San Juan Vanegas by Ojo de Agua and El Cedral.

Feb. 8th.—General DON FRANCISCO MEFIA, with the Third Brigade of Infantry, arrived. The General-in-Chief stays in Matehuala.

Feb. 9th.—We continue in Vanegas. The Second Division of Infantry, under command of General D. FRANCISCO PACHECO, arrives. Preparation of the existing forces here; formation of the advance guard. In consequence, the divisions will be composed of the following bodies: First Brigade—Second Light Battalion; Battalion of San Luis Potosi; Battalion of Morelia; Battalion Actives of Celaya. Second Brigade—Battalion Actives of Leon: First Battalion Auxiliaries of Guanajuato; Second Battalion Auxiliaries of Guanajuato. The battalion of sappers and miners and the artillery remained under the immediate orders of the General-in-Chief.

Feb. 10th.—A general order warns us that to-morrow the march will be continued. The Quartermaster-General, General D. PEDRO AMPUDIA, arrives.

Feb. 11th.—From Vanegas to the well of the Animas. Very cold, wind and snow.

Feb. 12th.—From Animas to the Salado. Cold, rainy, and some snow.

Feb. 13th.—The night before some soldiers and some women died of cold. The troops, starved, stiff with cold, refused to march; nevertheless it was not necessary to resort to force in order to produce obedience. Encamped in front of the Hacienda in two lines formed in close columns of battalions, with the artillery on the rear and flanks. There is a rumor that the march will not be continued because the enemy is near.

Feb. 14th.—We remain in camp. The brigade commanded by General DON MANUEL MARIA LOMBARDINI, which had arrived at Noria from Animas, was forced to return on account of bad weather.

This state of affairs was the cause of our detention at the Salado. Three soldiers who were frozen to death were buried. Rain and snow continue falling. At 10 o'clock at night the General was sounded, and we were warned that the march would continue on the following day.

Feb. 15th.—From the Hacienda de Salado to the Rancho de San Salvador. The weather improves. Camped in two lines in front of the Rancho, supporting the right by a battery and six companies of foot, and the left by two companies of horse.

Feb. 16th.—Remain at San Salvador. In the evening, the Second Brigade, which formed the first line, passed to take a position as rear guard of the right flank of the Second, occupying some corrals. The artillery fell back to the second line.

Feb. 17th.—From San Salvador to the Hacienda of the Encarnacion. In this place was found the detached brigade of cavalry which was under the orders of General D. MANUEL ANDRADE. Last night these fired upon some Americans, who fled, leaving a pair of field glasses and a bag with provisions. It is known that the enemy can be found encamped at the Hacienda of Aguanueva.

Feb. 18th.—Remained at the Encarnacion. General SANTA-ANNA arrived at 11 o'clock A. M. At 5 o'clock in the evening arrived the brigades of infantry with three eight-pounders, which were commanded by Generals GUZMAN and TORRES, and which had been left at Tula under the command of General D. ANASTASIO PARRODI. General SANTA-ANNA inspected the line on foot.

Feb. 19th.—We continue at the Encarnacion. The brigades of the Generals D. FRANCISCO PEREZ and DON JOSE GARCIA CONDE have arrived. During the night there was great alarm in consequence of the firing by the police guard upon some deserters, and which was taken up in part by the line. The camp was not formed according to regulations, but was in the shape of a pentagon, in a single line, with one of the sides covered by the cavalry. In front of the lines there were no other troops than the police guards, a few paces out from the center of the battalions. Further out, neither grand guards, nor advanced posts, nor patrols, nor sentinels, nor detached bodies in observation. The enemy could have been right in among us before we could have known it. This strange mode of camping, as well as other practices which were in use in the army, contrary to the science of war and the commands of the regulations, was constantly going on. This state of affairs was caused, without doubt, by the system of recruiting, the means used in raising levies, resulting in the troops deserting whenever the occasion presented itself.

This circumstance compelled the generals to keep the troops grouped together, thus depriving themselves of the means of security which should have been used. Hence, it is worthy of notice, the great disadvantage under which we labored in fighting against a general (TAYLOR) who could use even the last of his soldiers for all kinds of duty.

Feb. 20th.—General SANTA-ANNA reviewed the army, and found that it amounted to 10,000 infantry, 4,000 horsemen, and sixteen pieces of artillery, of which six were siege pieces—that is to say, useless in the country in which we had to operate. Attention has already been called to the fact of General SANTA-ANNA's remissness in having supplied the army with so small a number of pieces of artillery. The general order warning the army to get ready to take up the march the next day was published. Each soldier was to carry two rations of dried beef, a pound of flour, and sufficient water, since none could be got until we reached the Aguanueva. The officers did not busy themselves much about supplying their own wants, since they were provided the same as the troops.

Between one and two o'clock in the afternoon the troops commenced to defile out, which operation terminated at about four o'clock in the afternoon. The march was made in a single column and with the artillery and train, occupied a distance of some twelve miles in length. The order of march was as follows:

Vanguard—Four battalions of light infantry, battalion of sappers and miners, three pieces of artillery, section of park artillery, regiment of hussars, the first division of infantry under command of General D. MANUEL LOMBARDINI, with four cannon, the second division of infantry under the orders of General D. FRANCISCO POCHICO, with four cannon, the third division of the same arm under General D. JOSÉ MARIA ORTEGA, with three cannon, the division of cavalry commanded by General D. JULIAN JUVERA, without artillery, the general park and the provisions of the corps.

The rear guard was composed of a brigade of cavalry commanded by General D. MANUEL ANDRATE. General D. JOSÉ VICENTE MIÑON, with one thousand two hundred cavalrymen separated themselves from the army in consequence of a special commission.

The army had hardly been put in motion when an icy wind commenced to blow from the north, which increased proportionately with the approach of night. During the darkness, we passed the Tanque de la Vaca, celebrated for the frequent exploits of the savages, which at this season was dry. In the middle of the night we camped on the Llano de la Guerra at the edge of the Puerta del

Carnero. The battalions went to sleep formed in columns, the cavalry keeping their reins in their hands.

Notwithstanding the prohibition against fires, the women of the soldiers and the scullions, burned the leaves of the mountain palms on both sides of the roads; in consequence, we could see the camp illuminated in all directions, the light making a wierd contrast with the profound darkness of the sky. Soon the bad example spread, and the troops and even the officers burned the palm leaves also. The General-in-Chief, from his carriage, where he passed the night, saw the affair, and took it with quietness and patience, as much on account of its origin as for the rigor of the cold, the violence of the wind and the lack of shelter for the troops. Hardly anyone could sleep.

The enemy probably having notice of our march, redoubled his advanced guards and posts of observation. In spite of the apprehension of a terrible battle at the break of day, all desired the coming of the day on account of the change of temperature, for it would then be warmer.

Feb. 22d.—The day dawned cold. At 6 o'clock in the morning the movement of the army commenced upon the Hacienda de Aguanueva, prepared to enter into the conflict. As has been already said, the evening before General D. JOSÉ VICENTE MIÑON separated from the column with the object of accomplishing a special mission. This operation aimed at cutting off the retreat of the enemy by posting himself behind his rear guard upon the road to Saltillo; consequently the army thus marched in two columns upon divergent lines.

When the vanguard of the principal column, composed of the light troops, arrived before Aguanueva, it found the Hacienda abandoned. The enemy had destroyed all that he could not carry away, killed the animals and set fire to the Hacienda. Without giving time for the troops to drink water or fill their canteens, they were obliged to continue the march with quickened steps. All the cavalry passed at the gallop by the right of the column, in order to aid the vanguard in the pursuit of the enemy, who was supposed to be in full retreat, filled with demoralization. One could almost believe it on seeing the road strewn with goods from the sacked ranch and four or five abandoned wagons in different places: but the enemy had possession of the Hacienda of Buena Vista and the Puerto de la Angostura, and there waited with the greatest tranquillity.

When General SANTA-ANNA, who was with the vanguard, per-

ceived the presence of the American army, he found himself in a very critical position. He could not count on more than four light battalions and 2,500 cavalry, who had little service in this country. If the enemy, descending from his position, had attacked General SANTA-ANNA vigorously, the latter would have been overthrown, and his routed force falling back upon the main column, whose bodies were at a great distance from one another, and not having any reinforcements, it would have met the same fate as the vanguard. General SANTA-ANNA knowing this, without doubt, tried to gain time; indeed, he sent a negotiator to the camp of the enemy in the person of the Inspector of the Medical Military Corps, General D. PEDRO VANDERLINDEN, who is supposed to have had instructions to detain General TAYLOR as long a time as possible. Ostensibly he went to demand the surrender of the American army, announcing to the General of the army that he was surrounded by 20,000 men. As was to be expected, General TAYLOR rejected the summons, but afterwards took advantage of this piece of bravado, in order to affirm that he had been attacked by 20,000 Mexicans.

While this was going on the battalions were arriving and forming line of battle; but the rear of the column did not get into position until about four hours afterwards. Having traveled about sixty miles in twenty-four hours, not having slept, the troops arrived in front of the enemy more or less exhausted. The army formed in several lines, occupying the elevated points offered by the ground; the General occupied strongly a high elevation, *A*, upon which our right flank rested, and which the enemy had neglected. He put off straightening out our lines, *B B*. The artillery from both camps exchanged shots without doing any damage. In the meanwhile the battalions that were in line relieved one another in filling their canteens in a little stream of crystal water which flowed from the lines of the enemy and traversed ours. General TAYLOR observing the light troops occupying the hill to our right, immediately ordered his riflemen to impede them; this produced quite a lively combat, and when the light came on it found our soldiers the possessors of the ground, occupying the disputed eminence. The sounds of the trumpets of the First Light Battalion announced to the army that the hill was ours, and that the enemy was defeated. This produced great enthusiasm among the troops. In this combat Captain D. LUIS G. OSELLO distinguished himself. The night passed in quietude; the combatants passed the night in peace, and the American army made its fires.

The position of the two armies are marked on the map No. 2 appended hereto, the Mexican, "*M*," and the American, "*A*."

The enemy's position at Angostura gave him an incontestable superiority over us. The chains of mountains running thus parallel, coming close together at this place, formed a very narrow gateway. The heights to the right are higher than those to the left; the declivities prolonging themselves, forming hills which occupied nearly half the width of the valley, bounded by the heights mentioned above. The waters descending from them have cut deep gullies which come down almost perpendicularly to the road which ran from Aguaneva to Saltillo terminating, as is natural, in the lowest part of the valley. But the waters deposited in this spongy soil soak up rapidly; the earth dried by the ardent rays of the sun, cracks open, producing fissures in the soil which make this place almost impassable even for men, who can cross only with much difficulty. The road which runs along the foot of the hills, following the sinuosities which are presented, separated our ground from that of the enemy.

The Americans occupied to their right quite a high hill which rose from the spurs running perpendicularly to our left: the spongy and impassable ground to which I have referred before, serving as a defense. Along the eastern part of this hill passes the road to Saltillo. The American line of battle stretched from this road to the heights on our right which protected their left wing. They also made use of the boggy ground referred to and of the ravines that extended along their entire front. General SANTA-ANNA occupied only the ground to the right of the road, with the exception of one battalion which was posted in observation in the pass *O*. Thus the right of the enemy's position was unattackable, his front extraordinarily strong, and his left very well protected by the heights.

In the side of the mountains to the left, there are two narrow passes which are marked by the letters *P* and *Q* (see the map), which could be used by troops to cross up and over the mountains or heights and fall at an opportune moment on the flanks and rear of one of the combatants. But neither General SANTA-ANNA nor General TAYLOR thought of this operation which would have been decisive.

Having now an approximate idea of the configuration of the terrain, a thing so necessary to a proper judgment and understanding of the battle-field, it will not be out of place to make a comparative examination of the two armies which are about to engage each other.

The American army although formed by means of voluntary en-

listment, is composed of men of a civilization relatively advanced. The government amply remunerates its armed force, and it never suffers its employes to be behind in pay, for the treasury is always full. The clothing is of good quality; the food healthy and abundant, and the pay higher than in other armies. Notwithstanding the fact that the United States is republican, the regulations for the government of the army are severe and the discipline perfect. The instruction of the officers is very extensive, for in the regular army no one is admitted as a subaltern officer without having passed a satisfactory examination upon the conclusion of his instruction at the military school. Promotion to the superior grades is by seniority or for merit. Sergeants are not permitted to pass into the grade of officers. The generals are officers who have obtained distinction in their profession.

The weakest element of the American army is the volunteers, whose field and company officers are named by themselves or by the authorities of the States furnishing volunteers. When an individual has prestige enough to raise a regiment, he is usually named its colonel, and he appoints his officers. These forces are for the most part but little disciplined, commit disorders in the country in which they operate, and the day that their term of enlistment expires, should the humor strike them, they will disband and leave the service, even should it be on the eve of battle. In campaign they shoot well and fight with more frenzy, if they wish to, than do the regulars, but they have not the constancy nor the solidity of the latter. Of this class of troops the American government can raise any number it desires.

In war the American army does not depend for its subsistence upon the resources of the country where the operations take place. Its Commissary Department was supplied by transportation of supplies from a base, or by means of contracts that were generally paid in cash. In consequence, it always found itself well supplied with healthy food, so that even in the middle of the desert the soldier was as well fed as if he were in the center of population.

The wagon trains for the conveyance of the general park, of subsistence, of the treasury, and of equipage were perfectly arranged. They were composed of light wagons with four wheels, drawn by eight mules, and could go anywhere where light artillery could, and follow the army on its longest marches; these trains are the property of the government, or of contractors who supply them of uniform patterns.

The armament of the infantry of the line is a percussion gun

capable of carrying a five-hundred grain bullet, with a bayonet, and is charged with a ball and three buckshot, the powder being of a superior class. The cavalry, which can be classified as mixed or dragoons, use a carbine, pistol or saber, and are mounted upon large horses. The artillery is the system of Paixhans; the eight batteries are composed of six-pounders, twelve-pounders, and of twenty-four and thirty-six pounder mortars. The batteries have ammunition wagons, which follow everywhere in order to keep them supplied during the combat.

As to the number of troops General TAYLOR had at Angostura, I can judge only approximately from what I saw. The Americans formed in two lines, with a reserve; and our attacks were always met with lines of equal extension to ours.

Giving to the cavalry the just importance which it should have, they were relatively weak in this arm, and consequently strong in infantry, whose organization was perfectly adapted to the ground which it defended. The number of field guns, many of them light, all drawn by magnificent, large horses, appeared to number twenty-six. Part of these guns could maneuver on the most difficult part of this ground.

To sum up: the American army must have presented in battle from six to eight thousand men, with twenty pieces of artillery, in a very strong position.

Knowing this much about the American army, let us pass to a study of our own. As is known, the Mexican army is raised by what is termed the levy, that is to say, they take by force in the street those persons, who by reason of their humble station in life, can offer no resistance to the violence that is done them. Conducted to the quarters, they are obliged, under the switch of a corporal, to learn the manual of arms, the most indispensable in the service, and some other evolutions. As might be expected of a system of this kind, none enter the ranks but the most ignorant and abject of the people; that is to say, from among those that have the least interest in defending the country. Neither the diseased, nor the possessor of a large family, nor the vicious, are excepted from liability to service; and among the multitude of unfortunate ones that are torn from their firesides, the native race (Indian) furnishes commonly the greater contingent.

The wages are small, and badly paid. There have been troops for many years who have not received their full pay, and many times would have perished had they not resorted to manual labor in order to gain the necessary subsistence. Showy clothing is given

to the troops who find themselves in garrison in the large cities, in order to take part in the civil and religious festivities; but those that are far away lack many things which are absolutely necessary. Actually, in the army that marched to Angostura there were battalions that carried nothing on their bodies but some worn-out great-coats; that lacked blankets and capes with which to shelter themselves, and whose shakos were of palm leaves lined with printed cotton.

The food which was given to our troops consisted of a ration not always good nor abundant, which was charged to each individual at twelve and one-half cents daily; but in the field, where there was lacking the means or the time in order to prepare the ration, on account of the long marches which our troops were obliged to make, they issued to each soldier a piece of raw meat, some tortillas, or a small handful of corn.

The regulations governing the Mexican army are the same that ruled during the Spanish domination; but on account of the revolutionary discipline was notably relaxed. The officers were a heterogeneous lot; one part coming from the military college, the other coming from the class of sergeants, and likewise the army was increased, not alone by inferior classes, but also by peons, with whom the ministers wished to ingratiate themselves. Among us there is no volunteer militia properly so called, but during the revolutions it was customary to raise irregular forces with distinct designations, which were commonly included in the army.

So far as the rationing of the troops in the field was concerned, the government troubled itself but little. During the march of a force, whoever commanded it fed it from whatever resources could be found on the road. Nor were provisions carried in bulk, for even had they had them, they could not have carried them, owing to a lack of means of transportation. In the present campaign the only provisions that were collected at the Encarnacion, except the steers that were killed there, were some sacks of flour, a very small lot of sea biscuits, a few two-wheel carts, loaded with sugar in cone-shaped cakes and some brandy. Our army had no proper trains to transport its munitions and equipage, and when marching the troops employed pack-mules or the large carts of commerce of different styles and construction.

The armament of our infantry consisted of old English guns—flint-locks—carrying a ball weighing 700 grains. The cavalry, which was no other than light cavalry, found itself armed, one part with sabers and a flint lock carbine, while the others, and by far the

greater number, used in addition the lance. The artillery belonged to the Grivebal system, already out of date, containing a diversity of calibers, and mounted upon heavy and rough gun-carriages; there were lacking large mortars, which are of great effect. The guns were drawn by mules, harnessed with traces passing direct from the collar to the whipple trees, that made it extremely difficult to maneuver them. Neither in range nor in movements could they compare with those of the enemy (with the exception of four batteries of horse artillery). The batteries lacked proper ammunition wagons in order to supply them during a combat, using for this service the backs of mules, with a thousand inconveniences.

The number of men the Mexican army presented in the battle of Angostura was very far from being that claimed by General TAYLOR, as will be shown as follows: On the 19th of February the army passed in review at the Hacienda de la Encarnacion with 14,048 men, of which 8,837 were cavalry. General D. JOSÉ VICENTE MIÑON separated from the army with 1,200 horses on a special mission, so that the army set out from the Encarnacion with 12,848 men, that is, supposing that from the 19th of February to the 21st there had been no desertions, which cannot be presumed, we having been in camp during that time. During the twenty-four hours of marching, making a greater part of it by night, and struggling with difficulties, it is believed to be no exaggeration to suppose that not less than 500 men straggled and deserted, leaving thus 9,271 infantrymen, a number a little superior to that presented by the enemy.

Certainly we were very superior in cavalry, but the benefit that might have been derived from this arm was entirely nullified by the configuration of the ground. On the other hand the artillery of the enemy had great superiority over ours in numbers, as well as in quality. We could not count more than eleven pieces of field artillery, that is to say: five eight-pounders, five twelve-pounders, and one small seven-inch mortar. As for the rest, sixteen were siege guns, which in an evil hour were brought along, and which could not be utilized except in certain situations. But the greatest superiority of the enemy consisted in the advantageous position that he occupied.

I believe the necessary facts upon which to form a correct judgment in regard to the events which I am going to relate, have been given.

Feb. 23d. During the night nothing unusual occurred except some firing of no importance, which lasted only a few minutes. Hardly had there appeared in the horizon a faint ray of light, than there

commenced from the hill *A* a lively musketry fire. The enemy, reinforcing his troops, attempted to dislodge ours, who defended themselves well. In order to support this attack the Americans advanced their first lines as far as *DD*, forming in order of echelon with the right refused and strongly entrenched, advancing detachments as far as *EEE* in order to defend the crossings of the first ravine. Following this they detached a large column with the idea, no doubt, of supporting the attack upon the hill, and enveloping our right, then occupying the hill, it not having been possible to open the way by a front assault. The troops that passed the night upon the hill *CC* which commanded the road and formed the extreme right of the American line were moved to the center in order to reinforce it.

While this was taking place our troops commenced to move, marching to the front. The battery of horse artillery, composed of five eight-pounders, commanded by Captain BALLASTA, was posted at the point *G*, which was a very commanding position. The first line of infantry supported by the second descended into the first ravine, under the enemy's fire, forced the pass *EEE*, occupied the hill, and forming line of battle delivered a lively musketry fire. The result of this first shock was the capture of a four-pounder cannon, one of those captured by the enemy at Monterey, and causing the enemy much loss, and holding the position occupied. The capture of the cannon is in dispute between the battalion Querétaro and Aguascalientes.

By the road covering the left of the line of battle, marched a column *H*, composed of sappers and two other battalions, under the command of Colonel of Engineers, D. SANTIAGO BLANCO, but not being able to deploy in such a boxed up place, nor to suffer in inaction the fire of the enemy's battery at *L*, Colonel BLANCO changed the direction of the column and crowned the hill, which was to his right, where the combat had been raging furiously.

At the same time that our left and center were having these successes, the right was rolling back the enemy, who had attacked the hill, in spite of the reinforcements it had received, the light troops descending from the high ground, charging with the bayonet upon the Americans, who were retiring in disorder, suffering considerable losses. In this charge our soldiers showed implacability, wounding with the bayonet all those within reach. In vain many Americans, flinging away their arms, showed to our soldiers the rosaries with which they had been provided, crying out that they were Christians. In these movements musketry fire was going on throughout the whole line.

The great American column that supported the left of their first line advanced intrepidly upon our left; but the five pieces that BALLASTA commanded, in whose battery was General MICHELTORONA, by order of the General-in-Chief, delivered a fire so spirited and certain upon that column that one could see that every once in a while it was obliged to halt in order to re-form.

At this stage of the affair the light troops deployed in line of battle at the point *J*, struck the flank of the enemy's line, pouring into it a lively fire. The column, struck in front and in flanks, and also by the battery of BALLASTA, being unable to advance, halted and endeavored to deploy in some way, but soon confusion ensued, and the men dispersed completely, leaving the field full of fugitives. This episode of the battle is represented on the accompanying map, and can be said to have been the crisis of the engagement.

The first line of the enemy, seeing itself outflanked on the left, could not sustain itself, and fell back as far as *LL*, protected by the second line. Our troops could not follow immediately, because having suffered much, it was necessary to re-form and reinforce them with the second line. Some of the bodies, made up more or less of recruits, had a large number dispersed.

Those of the enemy had been rallied between the second line and the reserve. The Light Brigade, whose mission should have been to strike the American lines in the flank, while the other attacked in front, carried away by enthusiasm, or perhaps in obedience to orders, abandoned the place it occupied, and forming in column, pursued, advancing by the skirts of the mountains to the right, until it arrived at the Hacienda de Buena Vista at *M*, where it met an energetic resistance, but for want of artillery it could not accomplish anything. It met with considerable difficulty in retiring, for General TAYLOR, with his reserve troops, hindered its return to our field.

The battery of Captain BALLASTA left the position that it had occupied, and with a great deal of hard work, succeeded in crossing the ravine, and advanced as far as the point *N*, the center of our line, where he went into battery and delivered anew his fire. Our extreme right was then left without artillery. I believe, that with a little increased effort, the twelve-pounder battery could have been carried to the place which the eight-pounder occupied, and the battery (eight-pounder) could have been placed on the right of the line of battle in order to support it, and in order to cross its fire with the first. It is incomprehensible why this determination was not taken, inasmuch as the battery of twelve-pounders had hardly fired

a shot during the day, for in its emplacement it was hidden by the inequalities of the ground.

The cavalry advanced, divided into two grand columns, one of them marching along the skirts of the mountains to the right, and the other on the left hand side following the Saltillo road. They both left some squadrons in reserve. The column that marched to the right, traveled at first without meeting any obstacles, but later engaged in some combats up to the Hacienda de Buena Vista, overthrew the cavalry of the enemy, causing it to retire on being attacked, compelling the enemy perforce to bring out the reserve to his aid at the Hacienda.

Part of the regiment of cuirassiers, having passed through the enemy's lines, found it impossible to return to ours. During the advance of this column, the following incident occurred: The commander of a squadron of a regiment of hussars, D. JUAN LUYANDO, was about to lance a rifleman, who, getting down upon his knees, implored mercy. LUYANDO let him alone and passed on. The rifleman raised himself immediately, and firing upon him, to whom he owed his life, shot him from his horse, piercing him through and through with a ball. The murder of the commandant was in an instant revenged by his soldiers.

The left column being in a cooped-up position, and being struck by the battery at I, could not continue by the main road, but changed its direction to the right, and passing by the rear guard of the first line, maneuvered for the right wing, sustaining several combats as far as the Hacienda de Buena Vista, whence it was obliged to retire, because it could not overcome the resistance with which the Hacienda opposed it. These isolated attacks against a strong edifice could not produce favorable results. If the light troops and the cavalry had been directed simultaneously upon the flanks and rear of the enemy's lines, while they were yet engaged in front, the success would have been complete.

Much sorrow was caused by the fact that while the troops were fighting so gallantly, forcing the enemy to give ground, some recruits suffered great dispersion, and that some of the squadrons of the reserve, seeing the road to Aguanueva filled with fugitives, did not make an effort to detain and reorganize them.

It cannot be denied that the Americans fought valiantly, nor that their General maneuvered with skill, but notwithstanding all this their forces had lost the battle from the moment in which our troops overwhelmed the left of their lines. Notwithstanding the faults committed by our generals, and in spite of the lack of direction at

the critical moment noted above, the position of the American army was a perilous one. This, without doubt, was the judgment of General TAYLOR also, for he was commencing to prepare his retreat by the Saltillo road. Probably it was his design to retire by echelons, for which movement the ground was admirably adapted, and adopting these measures, gain the city of Monterey. If that retreat had occurred, our troops would have charged with greater vigor; our cavalry, profiting by the clear places, would have left the enemy no repose, and would have obliged them to leave on the field part of their war material, if it did not terminate in their complete rout before arriving at Monterey. But, unhappily, none of these things came to pass.

The train of the enemy's wagons, which had initiated the retreat, gave notice of the presence of the cavalry of General MIÑON, and not being able to advance further, nor hoping for troops to protect them, since they were all engaged in the battle, found no other resource than to retrace their steps and form a redoubt with the wagons rendezvoused at the Hacienda de Buena Vista, in order to augment the resistance. The dust and great movement of that column of wagons returning at the trot to the rancho on the Saltillo road, caused the belief at first that the Americans were receiving reinforcements, but immediately applying the field glasses and making observation, it was found out what was really taking place.

General TAYLOR was then, without retreating, enclosed in a narrow pass, with both ends occupied by the Mexican army. But the enemy had provisions, while we could not count upon securing one ration per man, nor had the officers any food, consequently it could not be hoped to oblige TAYLOR to surrender through hunger. It was indispensable to destroy him with arms. So, then, the scheme of employing the column of cavalry against the rear guard of the enemy, turned out contrary to our expectations. The maxim, "*A enemigo que huye puente de plata*," (to a flying enemy a bridge of silver) would have been well to observe at this moment. From this time on, General MIÑON took no part in the battle. It was 11 o'clock in the morning, and the struggle went on with ferocity. The number of our dead and wounded was considerable. General LOMBARDINI, who commanded a division, General D. ANGEL GUZMAN, who commanded a brigade of cavalry, and many chiefs and officers, had been conducted to the ambulances. The Americans had re-formed their lines, after the terrible crisis through which they had just passed, and presented themselves again to renew the combat.

It is true, that in spite of their courage, they could not recover

the ground they had lost, but they put a stop to the victorious march of our soldiers. The struggle continued without the balance leaning to one side or the other. General SANTA-ANNA had fallen, with the horse he was mounting, that had been wounded in the head by a grape shot. Time ran on, the number of victims increased, the struggle gave no evidence of ceasing. In addition, suddenly there came up a great storm that deluged both the combatants and compelled them to suspend the strife. This was at 2 o'clock in the afternoon. Both armies improved the time in reorganizing, in order to renew the contest, when a magnificent rainbow, spanning both fields, appeared, as if to invite peace. The downpour having terminated, the combatants remained quiet for some time. Only the battery of sixteen-pounders, situated at *O*, had carried on a duel with the enemy's battery at *L*, but without producing any notable results.

An incident then occurred which should be related here. From one of the ravines hard by, a man on horseback dressed as a peasant, went out, running, taking the direction of the enemy's battery. Every one believed he was a scout of the enemy who was endeavoring to take refuge in their lines or that he was carrying some information. But the man when he found himself among the guns of the enemy, uncoiled his lariat, launched it, and not catching anything, turned his horse upon his haunches and escaped under a shower of balls which fortunately did not touch him. As this deed was done just as a body of cavalry which came out from a ravine appeared upon the road, the enemy crowned the heights which were in rear of the battery with a multitude of riflemen. Our troops, full of admiration for the daring of the fearless soldier, who returned on a run to our lines, could not take their eyes off him. He was an old time insurgent named VILLAREAL, who was then serving in the artillery in the capacity of chief of caissons with the rank of second sergeant. He had endeavored, he said, to bring in a Yankee at the end of his lasso, for he could not remain idle. We were filled with admiration at such a display of gallantry, of which I have seen no mention in any official document or even in the newspapers. No one pronounces the name of poor VILLAREAL, who died afterwards in obscurity and poverty. An actual witness of the deed, I wish to pay homage in my diary to a deed so meritorious, to let every one know the man and his distinguished action. In this unhappy strife there were many other honorable deeds that have not been told.

The Americans having reorganized, threw themselves vigorously upon our lines, but were forced to retire leaving in the hands of our soldiers two guns, six-pounders, and three flags. One of these

flags was sent by General SANTA-ANNA to the legislature of the State of San Luis Potosi. In this combat, Colonel D. JOSE MARIA CANASCO conducted himself gallantly. Finding himself deprived of the command of the Second Light Battalion in consequence of the affair at Monterey, he went with the army, accepting an insignificant commission. But the temporary commander of the battalion, DON JULIAN DE LOS RIOS, having been wounded, CANASCO took the flag and placing himself at the head of the battalion threw himself upon the enemy, obliging him to retire. The Colonel was mounted upon a large, fat horse, which made him very conspicuous.

The cuirassiers who were looking for a pass through which to rejoin our lines, entered the cañon *P* with the idea of coming out through the narrow pass at *Q*. At such a distance they could not be well distinguished, and they were supposed to be a force of the enemy coming to attack us in flank. They might well have been taken for Americans, for their uniform was blue, and they had neither helmets nor breast plates. This caused not a little alarm on the extreme left of the line, which could not count upon more force than a small battalion of two hundred men that served as support to the batteries. Some one pointed out to Colonel D. CORONA, commandant of artillery, that it would be opportune to change front to the left some pieces of the battery at *O*, and also to change some iron twenty-four pounders at *R*, which had just been put in field earth-works in order to get a cross fire upon the exit *Q*.

The Colonel at first declined to do anything without an order from General SANTA-ANNA, but seeing the emergency, decided to order the maneuver, which was executed. General SANTA-ANNA who had also observed the movement of the cuirassiers, sent speedily his adjutant, General D. DIEGO AGUELLES, with an order to the battalion that supported the left batteries, to immediately occupy the mouth of the defile at the place it had been stationed the day before. During these movements the head of the cuirassiers appeared in the defile, but two shots from the twenty-four-pounders bounding towards them, warned them that it was not prudent to move forward. An officer detaching himself, rode forward to explain matters, and then the cuirassiers joined our lines.

Lieutenant-Colonel D. JOSE MARIA CASTRO, known as the "bearded," dressed in uniform "de rigueur," as he always was in war, was ready to take up his march to the defile *O*, when the arrival of the cuirassiers suspended the march. The alarm which the appearance of this small force in the defile *O* caused our troops, can give an idea of the effect which would have been produced by a

formal attack on the part of the enemy. Reciprocally the effect would have been the same upon the enemy had our troops defiled from the cañon *P* during the heat of the battle. This was the last incident of the battle of the 23d.

The Americans deployed their lines between the points *SS*, and our first lines were formed at *TT*. The battle had completely ceased. Now and then shots fired between men engaged in individual combat could be heard. Our troops were squatting down close to the ground, holding their guns vertically, with the butts resting on the ground, retaining the last position they had conquered. The appearance of the troops was flattering, in spite of the fact that they had not had food all day. They appeared happy and contented for having overcome thus far the obstinate resistance of the Americans.

It was believed that there was nothing more to do but to work during the night to extend our line towards the right, and to plant a battery upon the heights *W*, in order on the following day to enfilade the enemy's lines. It appears to me it would not have been very difficult to conduct as far as *W* the battery of eight pounders, replacing this with the twelve-pounders and the seven-inch mortars, so that we would have had in line on the following day fourteen pieces, whereas on the 23d we had only nine. The battery of sixteen-pounders would have remained at *O*, and that of the twenty-four pounders, which had just been mounted and placed in position on our left flank upon the road, united, these six pieces of large caliber would have produced good effects upon the right of the enemy's lines. There only remained then to get all our pieces in action, and concentrate their fire upon the lines *SS*, as is indicated upon the map. Taking into consideration the losses the Americans had suffered, and the state of demoralization in which they found themselves, it is credible that on the following day our army would have consummated its overthrow. These were the hopes of the army so discussed by many officers; but misfortune pursued us, and ordered otherwise.

At sundown an order was communicated to our lines, which caused dispositions for retiring to be made. This disposition caused general and profound disgust among the troops; they saw with grief that they were going to lose the benefit of all the sacrifices that they had made; that the conquered field would be abandoned, and that the victory would be given to the enemy; and finally, to affirm the idea already general in the army—that it was impossible to conquer the Americans. The reasons that were given for the

retreat were as follows: There was nothing with which to feed the troops; that the army found itself very much fatigued, and could not have fought the next day; that had it remained all night on the field of battle, it is possible that many of the organizations would have disbanded. These reasons were specious in the extreme. If there was not food for the troops at the place occupied, there was just as little at Aguanueva, where they remained for several days in camp after the retreat. Moreover, on the night of the 23d it happened that some of the troops who had prepared food did not have time to issue it on account of the retreat, emptying the food upon the ground in order to load their kettles upon the mules. The exercise of a little foresight would have caused cattle to have been killed and roast beef issued during the night upon the field of battle. For many days the army was fatigued, and for this reason needed rest all the more in place of marching fifteen miles to Aguanueva, where it would have to give battle, provided the enemy should pursue vigorously. The same fatigued condition of the army should have shown that the troops would not have disbanded, since they were all too tired, and thought only of resting. Moreover, the troops, seeing victory ahead of them, were enthusiastic, and under these circumstances would never have abandoned their colors. Likewise they knew that the enemy had in Saltillo storehouses filled with provisions, clothing, and even money; on the other hand the rear guard of our army had only an uninhabitable desert to march over on their return. The troops received with much disgust the order to retreat.

Shortly after night fell, taking advantage of the dim light of the new moon, the troops descended from the heights which they had conquered with so much sacrifice, and formed in column upon the road. Fortunately the enemy did not divine our movement, for a vigorous attack under these circumstances would certainly have produced a disaster. At first the march went on in an orderly manner, but the disgust that the troops experienced, and the desire of each individual to get to the point of rest as soon as possible, caused each one to march as he pleased, mixing up the soldiers of one battalion with another, causing in this way the utmost confusion. The confusion was of course necessarily augmented by the darkness of the night. As the army got nearer its destination, it was guided by the light made by the burning of the Hacienda de Aguanueva, which assumed large proportions. Everyone dropped down where he found himself and went to sleep, and only the artillery, which went into park on the right of the road, remained united. During the same

night, General SANTA-ANNA held a council of war, composed of the general officers and the generals of artillery and engineers. The council decided, reducing its conclusions to writing, that the retreat was absolutely necessary.

Feb. 24th.—The morning of this day was employed in getting the soldiers into their own battalions. At about 10 o'clock in the morning a staff officer of General TAYLOR's arrived with a flag of truce; he proposed to deliver up our wounded left on the field of battle and to exchange prisoners. I believe that the true object in sending him was to investigate the *moral* of the General-in-Chief and the condition of the army. General SANTA-ANNA ordered the bandage which covered his eyes removed so that he could see perfectly that order was reestablished in our camp, which presented in every respect an imposing appearance. Already from the quietness of the camp one could appreciate the losses we had sustained. In all there were 3,494 killed, wounded or missing; that is to say, more than a quarter of the force. In detail as follows:

Killed	591
Wounded	1,037
Bruised	12
Missing	1,854
Total	3,494

Of the killed were:

Chiefs and officers	23
Troops	568
Total	591

Wounded:

Generals	2
Chiefs and officers	101
Troops	934
Total	1,037

Missing:

Chiefs	1
Officers	6
Troops	1,847
Total	1,854

Bruised:

Chiefs	3
Officers	2
Troops	7
Total	12

This shows a loss of one officer to every twelve men.

Munitions of war used up:

Cannon balls	571
Rifle cartridges	555,000

Of the officers who set out the latter part of the previous year (1846) from the military college, D. AGUSTIN LINDEN and Sub-Lieutenant D. JUAN B. NAVARRO and D. JOSE PICHARDO, were killed.

In our casualties appeared 1,852 dispersed. These consisted of recruits, who commenced to disperse from the beginning of the battle, who, on account of a lack of foresight in not providing the proper means of bringing them back when it happened, did not return. Our opponents suffered no inconvenience from dispersions, partly because their troops were better disciplined than ours, and partly because fighting in a foreign country, the instincts of self-preservation caused them to remain united. And, besides, General MIÑON, with his cavalry, was believed to be in rear of the American army, and those desiring to leave would have fallen into his hands. It is no easy matter to estimate the losses of the enemy, they having remained masters of the field, but it is rational to believe that they were not greater than ours—they should even have been less. My reasons are as follows: The attacking party generally suffers greater loss than those who defend a position, but there is a compensation where the defenders turn their backs, for then their adversaries take advantage of this turn of affairs to revenge themselves. During the day of the 23d not once, but several times, did we see the Americans obliged to retire in disorder. Upon the field occupied by our troops could be seen as many dead Americans as Mexicans.

The caliber of our guns being greater than those of the enemy, the wounds given were of the gravest character. As an offset to this, the three buckshot which accompanied the bullets of the enemy produced the greater number of wounds. In consequence, it is logical to conclude that we should have had the greatest number wounded and the enemy the greatest number killed.

Although it may be urged that the Americans, in general, shot better than our soldiers—a circumstance which is without doubt most essential in a contest between riflemen, still much of its importance is lost in attacks in line, where the soldiers, blinded by the smoke and filled with excitement by the struggle, do not aim properly—therefore the losses of the enemy should have equaled ours, but they ought to have had a greater number of killed.

The appearance of the encampment at Aguanueva was tranquil; the fatigue undergone during the preceding days caused the troops to remain quiet—only the necessity for hunting food caused them to run about from one place to another. Two officers partook of a cake of chocolate, without any other accompaniment; four others

were eating together a small plate of rice, without bread or anything else.

In the wood near the Arroya were camped the carts which hauled the wounded. These unhappy ones, whom none heeded, clamored with pitiful accents that aid be given them. Those who had died the night before were thrown out of the carts and were covered with their mantles, and appeared to be sleeping.

But from that pitiful picture, the sight turned to the Hacienda and contemplated other spectacles more harrowing. In the principal house, the roof of which had been consumed by the flames, was established the field hospital. There the wounded, without distinction of rank, lay upon the floor in such great numbers that one could not walk about among them. There also went on amputations and the most cruel operations, in plain sight of the other unhappy patients. In a contiguous chamber, also unroofed, could be seen legs and arms of no further use to their owners. Outside this bloody precinct, the dead animals left by the enemy, and the carcasses of steers slaughtered to feed our troops, completed this horrible spectacle, making an indelible impression upon the strongest minds.

Feb. 25th.—Continued in camp. The bad food of the troops, little or no shelter in a season of the year so raw in that region, caused in the army an epidemic of dysentery and diarrhœa, which afflicted the greater part of the men.

Feb. 26th.—During the retreat from Angostura the enemy did not come out from his position to harass us, even the shortest distance. This proves conclusively how much he suffered in the battle. At two o'clock in the afternoon we commenced to break camp. The first to march were the wounded; but the few carts would not hold them all, so that hand litters had to be improvised by using four guns and covering the square thus formed by mantas or blankets. In each one of these hammocks, carried by four soldiers, was a wounded man. In this manner they managed to make forty-two miles through the desert without meeting any water. The soldiers weakened by hunger, many of them sick, worn out by fatigue, filled with discouragement, threw upon the ground the burdens they were carrying so wearily, and others deserted, being no longer able to endure their afflictions. On this account the road was lined with stragglers, wounded men and even the dead. Following the file of litters came the wagons and ox carts that had been seized, making a creaking noise with their enormous wheels. The night came soon. A cold wind blew the dust made by the marching troops through

the column. The pallid moon crazily chasing through the clouds, hardly shone bright enough to light up this sombre and distressing scene. In contrast to this was the woods of burning palms which covered the whole plain, and which had burned without cessation since the 21st. Soon the rear guard overtaking and passing the convoy of the wounded, produced confusion, and the moon hiding itself at this same moment added to the disorder, the poor wounded men in consequence being the victims of a thousand acts of inhumanity. Finally, at one o'clock in the morning, the advanced guard of the army arrived at Encarnacion, and just as had happened at Aguanueva, every one threw himself down wherever he could. The appellation of "La Noche triste," might with all justice be also applied to this night.*

March 12th.—To-day the army entered San Luis Potosi, after an absence of forty-four days from the time the first troops set out.

OBSERVATIONS.

I have no reliable data concerning the loss suffered by the army in its disastrous retreat across the desert, but I believe, without exaggeration, that it was 3,000 men, most of whom were deserters.

Two causes, to my mind, operated toward the unfortunate ending of this expedition, the first being the fact that necessary provisions were not carried. Since the fact of the character of the country to be passed over was known, this should have influenced the authorities to have done so. Second, the lack on the day of the battle of the necessary light artillery, which could have maneuvered upon the left flank and upon the rear of the enemy when it was enveloped. These errors committed by General SANTA-ANNA were dearly paid for in the loss of the battle.

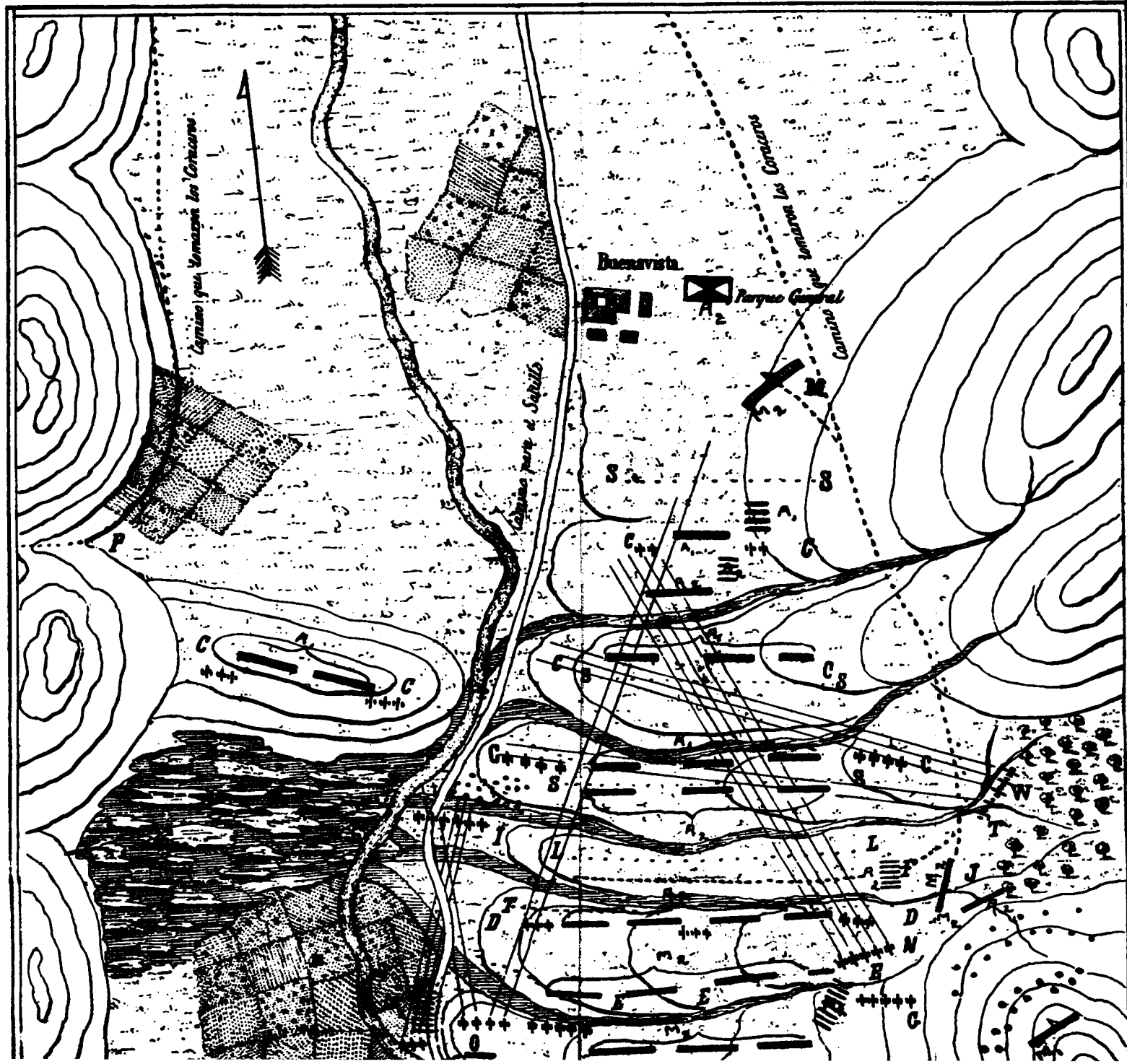
With regards to the retreat on the night of the 23d of February, I have already said enough, both pro and con. The General-in-Chief has tried to exculpate himself by placing the blame upon the weariness of the troops, the lack of food, and the fear of disbandment. In the course of my remarks I have endeavored to show the fallacy of these assertions; maybe other reasons more powerfully weighed upon General SANTA-ANNA. Alarmed at the great losses suffered by the army on the day of the 23d, and particularly by the dispersion which took place in some of the bodies, he doubted the result of a new battle on the next day, and taking into consid-

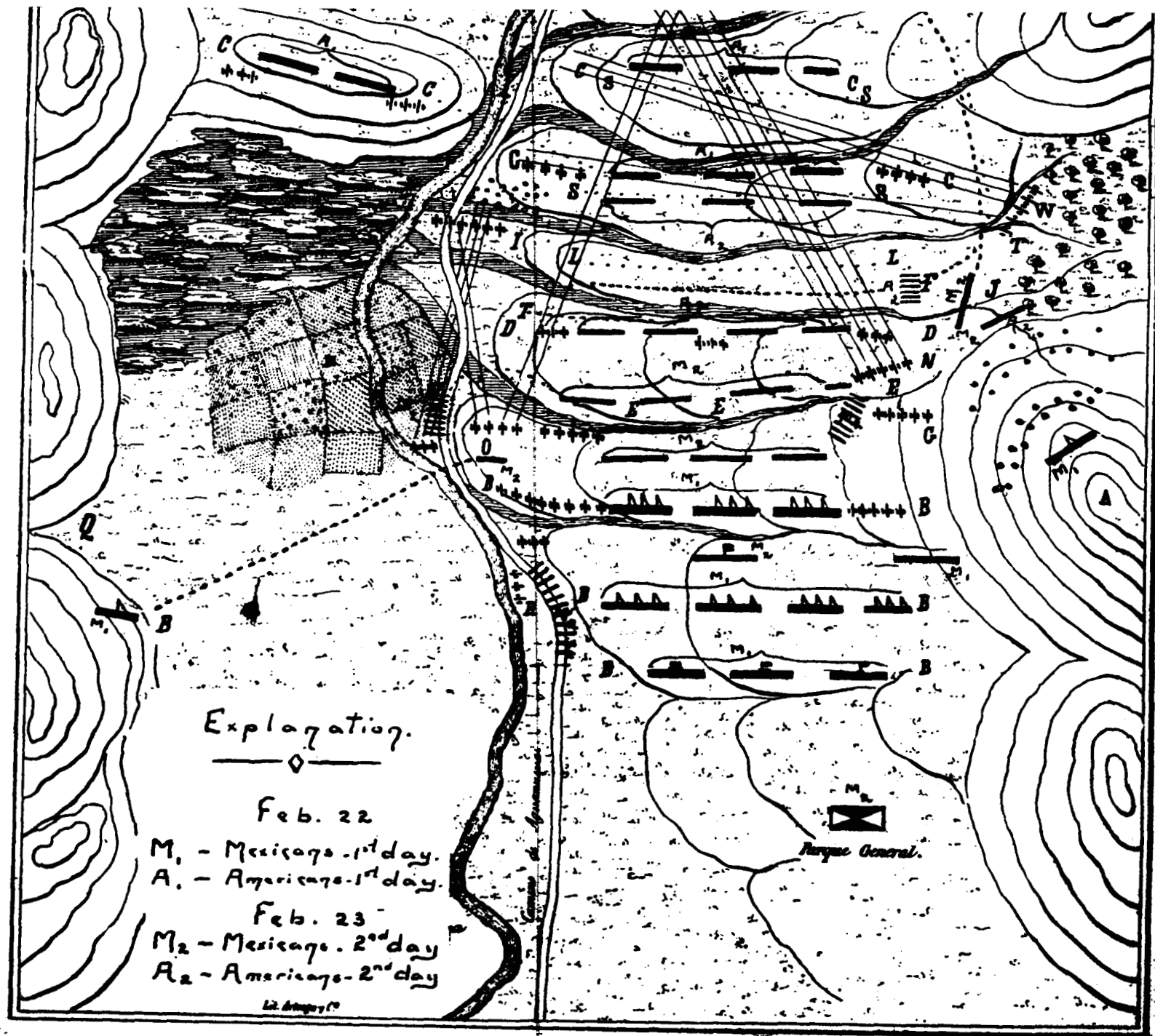
*NOTE BY TRANSLATOR.—From February 27th to March 12th, being simply an account of daily marches without interest, the translator has not written that part of the diary, but will close with the return of the army to San Luis Potosi on March 12th, and followed by a few observations of the author on the conduct of the expedition.

eration that the Republic had no other army with which to oppose the invader, who had already another army forming in the East, SANTA-ANNA feared that if in a new battle he was overthrown, the Americans would penetrate into the very heart of the country, without encountering any resistance.

Without doubt, considering the great responsibility, which rested upon General SANTA-ANNA, the reasons given above ought to have much weight, and I believe that history should take the same into account when judging this affair. But how painful the thought that the efforts and great sacrifices that the nation and the army had made, should have remained without some fruit, even if they did not destroy the army of General TAYLOR.

If the army had succeeded in conquering the Americans, General SANTA-ANNA would have been to the Republic what he was in 1829, but the retreat from Angostura dug his political grave.





Map of the Battle of Argostyra
(Buena Vista)

THE MATABELE WAR.

MR. F. C. SELOUS'S NARRATIVE.

[FROM THE LONDON "TIMES," OF TUESDAY, FEBRUARY 6, 1894.]

THE Union Royal mail steamer "Spartan," from the Cape, anchored in Plymouth Sound at 9 o'clock on Sunday evening. Among the passengers was Mr. F. C. SELOUS, the famous explorer and hunter, who returned to South Africa a few months ago, at the beginning of the troubles with LOBENGULA, after only a short stay in England. MR. SELOUS handed to REUTER'S representative the following account of the FORBES and WILSON expeditions, which he had written during the voyage home:

FLIGHT OF LOBENGULA.

On December 3d Major FORBES, following on the tracks of LOBENGULA'S wagons, reached the Tchangani River, and found the King had only crossed to the northern bank that same day. This fact was very evident from the freshness of the wheel marks in the muddy ground and the condition of the fires which were still burning in the camp which LOBENGULA had just vacated. In this camp a halt had been made of some days' duration, as a large, well-built, rain-proof hut had been built for the King's accommodation.

Messrs. BURNUM and INGRAM, scouting on ahead of Major FORBES'S column, here captured a Matabele lad who was lying asleep in one of the huts within the deserted camp. From this boy, who gave himself out to be a son of MAKWAZKWI, the head induna of Buluwayo, it was gathered that LOBENGULA had only got his wagons across the river a few hours before Major FORBES arrived upon the scene, and had once more fled northwards on hearing of the near approach of the white men.

By this time all the horses at Major FORBES'S disposal, owing to their having already been many days without corn, doing hard work

on young green grass, and at the same time being exposed night after night to heavy rains without any kind of shelter or even a blanket, had got into a very low, weak condition, so that there were but few amongst them that were fit for a hard day's work. And if the horses had had a bad time of it owing to poor feeding and exposure to constant rain, it may be judged that their riders (as fine a lot of young Britons as England, Scotland, Ireland and South Africa could produce) had already endured great hardships and privations.

MAJOR WILSON IN PURSUIT.

Late on the afternoon of the day of his arrival at the Tchanganí, Major FORBES sent a patrol across the river with instructions to follow the King's wagon tracks in order to see in what direction he was going, and also to endeavor to capture a Matabele prisoner and find out from him the exact whereabouts of the King and the number of men who were with him. This patrol was expected by Major FORBES to return to the main column before dark.

There was still about an hour's sun when Major WILSON, with a picked body of fifteen men, crossed the river they were destined never to see again. Amongst these men were the two American scouts, BURNUM and INGRAM, who throughout the campaign have rendered most valuable services to the expedition, and eight of Major WILSON's officers; in fact, these fifteen men were the flower of the Victoria column. Just before crossing the ford Major WILSON sent Captain BOWEN, one of his most trusted officers and intimate friends, back again with a message to Major FORBES telling him not to follow after him, as he was not going far and would be back by sundown. Even at this time the thought must have flashed across this brave man's mind that desperate work might be before him, and Captain BOWEN's young wife will ever bless his memory for the kindly thought that prompted him to think of her in this moment of excitement, and find an excuse to send her husband back to the main column.

After crossing the river, and as it was already getting late, Major WILSON pushed along the fresh wagon track as fast as his tired horses would allow him to go, and just at dusk came up to a large encampment of natives on the right hand side of the track. On approaching this encampment, BURNUM galloped up to it and found it to be full of Matabele men, women and children. Most of these, although the men were all armed with guns, burst through the fence and bolted into the fast darkening forest behind them on seeing the approach of the white men. BURNUM, however, stopped one man, who, on being questioned by Captain NAPIER, the interpreter, said

that the King had only passed the spot late in the afternoon, and affirmed that at the present moment he was camped a very short distance ahead. He was then told to take the white men to the King, which he expressed himself quite willing to do, and at once ran forward along the wagon spoor at a pace that required the horses to canter to keep up with him.

Very soon another large encampment was reached; here also the men were all armed, but had their women and children with them. Like the first lot encountered, they, however, made no attempt to oppose the advance of the white men, but retreated into the bush. At their approach here the man taken prisoner at the first encampment gave his captors the slip, but another was secured to take his place, who upheld the story told by the first, and said that the King was quite close.

Once more, guided by his second captive, Major WILSON's little band rode forward into the fast gathering gloom of approaching night, deceived, I think, by the demeanor of the natives into the idea that LOBENGULA would be willing to surrender without fighting if taken by surprise. After this they passed several more large Matabele encampments—seven in all—all full of men, women and children. By this time it had grown quite dark, and they were riding up an open valley skirted on each side by thick forest. Just within the bush at the head of this open valley they could see fires burning, and, pointing to these, their last-captured guide said, "Nansia Sihongno inkose" ("There's the King's encampment; he is there with his wagons").

LOBENGULA SUMMONED TO SURRENDER.

Major WILSON and his men forthwith cantered up, and presently, by the light of a fire, found themselves in close proximity to an encampment surrounded by a high fence. Within this enclosure stood the King's wagons, and in one of these lay LOBENGULA himself, though of this Major WILSON and his men were not absolutely certain at the time. Nor could they see in the darkness the white tent of the wagon, which was, however, plainly seen showing above the fence on the following morning.

Ranging his men up within a short distance of this high fence, Major WILSON bade his interpreter call upon the King to surrender, at the same time promising him fair treatment. To this exhortation no answer was returned, but a considerable rustling and movement could be heard within the enclosure, which was, indeed, full of armed

men, who did not know exactly how to act, as they were ignorant of the number of the whites, whose forms were but dimly discernible in the darkness. The interpreter then again called out, "We do not want to fight any more or kill more of your people. Enough blood has already been shed. Let your King come out and talk to us, and hear the words we bring from the chief of the white men." To this again there was no answer, but it was now seen that men were constantly rushing into the enclosure from the outside darkness, warriors, probably from the encampments, rapidly passed before the King's wagons were reached. There was a horse tied up outside the fence, and, whilst waiting for an answer, one of WILSON'S men, named ROBERTSON, dismounted, and was advancing to secure it, when the sound of further movement within the enclosure and the ominous clicking of gun-locks made Major WILSON think that the Matabele were about to make a rush and endeavor to surround them in the darkness, so he at once called to ROBERTSON to come back, and, as soon as he had mounted, quietly withdrew with all his men from the immediate neighborhood of the King's wagons.

Shortly afterwards a very heavy storm of rain broke over them, and the night became intensely dark. Soon after Major WILSON had retired, LOBENGULA mounted a horse and, accompanied by MAKWAZKWI, the head induna of Buluwayo, and three other men, all of whom were also mounted, rode away northwards, leaving word that his people were to burn his wagons, and then, after stopping the advance of the white men, were to follow him with the women and children and cattle. This at least I heard from his brother INYANDA, and it is probably more or less true, though not perhaps correct in every detail.

Now, Major WILSON had left two of his men at a point on the wagon track before it got dark for some reason which I do not quite call to mind, and he was much concerned about the safety of these men, and some time was spent in trying to get back to them. Major WILSON, himself, and BURNUM, the American scout, going down on their knees and feeling with their hands for the spurs of their horses. At last they were obliged to shout for them and run the risk of letting the Kaffirs know their whereabouts. Their shouts were answered and the missing men recovered.

MESSAGE TO MAJOR FORBES.

Shortly after this, the night being still young, Major WILSON determined to send Captain NAPIER and another back to Major FORBES.

telling him that he believed he was close up to the King and hoped to capture him on the following morning. No direct message was, I believe, sent to Major FORBES for reinforcements, but when that officer asked Captain NAPIER what he thought Major WILSON wanted him to do, Captain NAPIER replied that Major WILSON wished him to join him before daylight with his whole force and two Maxim guns. But at this time Major FORBES knew that a Matabele impi was in the bush in his immediate vicinity, whilst at the same time the river was rising fast. After a consultation with Commandant RAAF, a most experienced man in native warfare, and one who has the reputation of being personally very daring and at the same time cautious where the lives of his men are at stake, it was decided that it would be madness to attempt to cross the rapidly-rising river in the darkness with the Maxim guns, as the noise that would necessarily be made in effecting such an operation would be sure to attract the attention of the enemy and might provoke an assault in overwhelming numbers under cover of the darkness.

REINFORCEMENTS SENT.

Under these circumstances Captain HENRY BORROW, with twenty men of the Salisbury column, was sent to Major WILSON'S assistance, leaving it open to that officer to either attempt the capture of the King with thirty-five men or to retire upon the main column if he thought there was likely to be a determined resistance. Unfortunately WILSON and BORROW and the gallant little band of men under their command, not knowing the terrible odds they would have to encounter, decided to attempt the King's capture forthwith rather than fall back on the main column without striking a blow.

All through the long hours of this dark, rainy night Major WILSON and the twelve brave men who were with him (two having left to carry the message to Major FORBES in the early hours of the night) stood patiently beside their horses, from whose backs the saddles were never removed, as it was evident from occasional shoutings that were heard that the Kaffirs were moving about, and a surprise had to be guarded against. At last, just as day was about to break, the beat of horses' hoofs on the sandy ground was heard, and soon afterwards Captain BORROW and his men rode up.

ANOTHER SUMMONS TO LOBENGULA.

After a short consultation it was determined to make a dash for the King's encampment at once, and to endeavor to capture his

wagons, in one of which it was hoped he would still be found. As the spot where Major WILSON and his men had passed the night was but a short distance from the King's encampment, it was still barely daylight when the thirty-five mounted white men rode up to it on the morning of December 4th. As on the previous evening one of Major WILSON's men, who spoke the Sintabele dialect, called upon the King to surrender. This call met with an immediate response, though not a verbal one, for scarcely had the interpreter ceased speaking when a body of men, estimated at about 100 strong, poured out of the enclosure, and lying out in skirmishing order in the bush to the right of where the white men were standing, at once opened fire upon them at a distance of less than 100 yards. It was so early that the flashes of flame could be seen issuing from the muzzles of the rifles. The white men at once dismounted and returned the fire, when it was perceived that another body of natives were working round in the bush to their left. Seeing this attempt to outflank and surround his little party, Major WILSON ordered his men to remount and retire down the open valley behind them. At this time two horses had been shot, but no white man had been hit. The two men who had lost their horses were taken up behind two of their companions, and the whole party retreated at a hard gallop down the open valley, taking up a position behind an immense ant heap at a distance of about 600 yards from the King's encampment. They were followed by the body of Matabele, who had first fired on them, and these men charged out boldly into the open, running down the open valley to within 200 yards of where the white men had taken up their position. Then, however, finding themselves exposed to a heavy fire from behind the ant heap they swerved off into the bush skirting the valley, from which they kept up a continuous fire.

Very soon the second body of natives, who had been running in the shelter of the bush skirting the left-hand side of the valley, again outflanked the white men and opened fire upon them. Here two more horses were shot, but again no white man was wounded. Once more Major WILSON and his men retreated down the valley, hotly pursued by the Matabele, who, however, kept within the shelter of the bush on either side of the open valley. This time four men had to be carried on tired horses behind the saddles of their companions.

ANOTHER MESSAGE TO MAJOR FORBES.

After retreating this second time for a short distance, the white men dismounted, and once more stood at bay. Major WILSON then

called up BURNUM, the American scout, and GOODING, and asked them if they thought they could ride through to Major FORBES and ask for reinforcements. "We will try, Major," answered BURNUM, "but should like FRED INGRAM to go with us," INGRAM being BURNUM's great chum and fellow American scout. The three messengers at once galloped off, taking the King's wagon track, along which they had come the previous day, from the Tchangani River.

All this time the Kaffirs were keeping up a hot fire from both sides of the valley, which the white men were answering steadily. That Major WILSON thought his position a desperate one even at this time may be gathered from the fact that the last words GOODING heard him say were: "Keep your hearts up, boys; we'll fight our way out of this yet."

BURNUM, INGRAM, and GOODING, after leaving their comrades, at first rode down the valley to get clear of the Kaffirs in the bush to their right, and then made for the King's wagon track, which they were just approaching when they met a large body of Matabele coming up from the direction of the river. These men opened a heavy fire upon them, but as their horses were moving rapidly, no damage was done, and the three white men outflanked and passed them. They had only just got clear of this first body of Matabele when they came on a second, much larger, force advancing rapidly through the bush, and evidently bent upon taking part in the attack on Major WILSON's party. When these men saw the three white men, they charged forward, thinking they would be able to surround them in the bush, every savage warrior humming out the word "Jee-ee," and producing altogether a volume of sound calculated to make the stoutest heart beat fast. It was with the greatest difficulty, BURNUM told me, that he and his companions managed with their tired horses to outflank these swift-footed savages thirsting for their blood, but at length they got clear of them, and eventually made their way down to the Tchangani River, which they struck at a point a considerable distance below the wagon ford. At about 8 o'clock they reached Major FORBES's column. During the night and morning the river had been rising rapidly, and in recrossing their horses had to swim.

BURNUM, INGRAM, and GOODING were the last men that saw poor WILSON and BORNOW and their men alive, and we only know what happened subsequently from native report. I well remember when INGRAM was asked by Dr. JAMESON if it was not possible that Major WILSON and his men might have outflanked the Kaffirs to his left

and retreated down the Tchangani River, the American scout replied, "I guess not, doctor, four of the men were dismounted, and the horses of many others were completely done. Some of those with the best horses might certainly have got away, but they were not the class of men to leave their chums. No, Doctor, I guess they fought it out right there where they stood."

THE LAST STAND.

We now know approximately what happened. The two Matabele regiments met by BURNUM and his comrades on their way to the river closed up in the rear of Major WILSON's party, and the little band of white men were soon exposed to a very heavy rifle fire from every side, for it may interest Mr. HENRY LABOUCHERE to know that the Matabele, far from being savages, only armed with spears, as he had asserted, were at the commencement of the war possessed of from 1,200 to 1,500 Martini-Henry rifles in perfect working order, and over 100,000 rounds of ammunition, and of these rifles probably 800 or 900 were in the possession of the regiments that accompanied the King in his fight towards the Zambesi.

For some time the white men, who were most of them very good shots, kept their assailants at bay. One by one, however, horses and men fell dead and wounded, the survivors taking shelter and always keeping up a hot fire from behind the dead horses. At length, encouraged by their indunas, the Matabele, with loud shouts of "Ingena go imcuto" ("get at them with the assegai,") "Gwaza Mashlauza" ("stab them at close quarters,") rushed in in overwhelming numbers, and, as the American scout INGRAM thought they would do, the little band of Britons fought it out right there. Even at the supreme moment when the savage warriors were fast closing upon them no man thought of mounting one of the still unwounded horses and trying to escape up the open valley towards the King's encampment. Like the Scots at Flodden Field, they stood to the last "in desperate ring" round their dead and dying comrades. One last deadly volley they poured into the mass of their assailants at close quarters, and then drawing revolvers and clubbing rifles, died fighting to the bitter end.

Had Major WILSON given the order for a general *sauve qui peut* soon after the departure of the three scouts, it is certain that some of the best mounted men of his party would have escaped. But at that time four men were already horseless and the horses of others were knocked up, and no man there dreamt of deserting his com-

rades and saving himself. They were not men of that class, and so shoulder to shoulder they stood and died together. Mashonaland has lost some of her best and bravest colonists, amongst them men like ALAN WILSON and HENRY BORROW, whose places no man can ever quite fill. Many a home, too, in England, Scotland, Ireland and South Africa has been rendered desolate by the death of these brave men.

ENGLISH OPINION.

In Mashonaland, however, and, I think I may say, throughout South Africa, the heart of every British-born man will swell with pride when he remembers how nobly his countrymen stood by one another; how well they fought against desperate odds, and how nobly they died in the forest beyond the Tchangani River. I would hope, too, that some sympathy may be felt for their fate in this, their mother country, beyond the immediate circle of their friends, but it is almost too much to hope, I am afraid, in a country where Mr. HENRY LABOUCHERE is allowed to publicly denounce the brave men who have just died so nobly, as well as all other Englishmen in Matabeleland, as murderers, border ruffians, the riff-raff of South Africa, etc., not only without arousing any feeling of indignation, but without eliciting any but the most lukewarm defense in the press in England and Scotland. Captain LENDY, too, has gone to his grave without bringing Mr. LABOUCHERE to account for the calumnies he has published against him. To resume: I regard as entirely apocryphal the account circulated as to Major WILSON's party having at one time dispersed the Matabele, who subsequently returned to the attack with reinforcements, and also the story of the cautious advance of the Matabele after nearly all the white men had been killed, when it is asserted they found the few wounded survivors writing on bits of paper. Nothing is more certain than that the firing was continuous from the time Major WILSON's last messenger left him until the last volley, and the fact that this last volley was a heavy one, showed that when the Matabele made their rush there were still a good number of white men left alive. The end must then have come very quickly. Commandant RAAF told me that he listened most carefully to the firing, which was plainly audible to Major FORBES's party on the south bank of the Tchangani, and that it was all in one spot, after the first shots near the King's wagons. At last there was a heavy volley and then silence. Then three single shots were fired, also in the same spot, after which no more shooting was heard. Other men with Major FORBES said that after the last

volley several scattered shots were heard which sounded farther away than the last volley, and it was on the strength of these scattered shots, which some men are reported as having heard, that hopes were long entertained that at the last some of Major WILSON's party had mounted the best of the surviving horses and made a dash through their assailants. Had any escaped in this way they would have been cut off from the river, and thus unable to rejoin Major FORBES, and it was thought that they would make their way up to the road leading from Matabeleland to Hartley Hills and then make their way to Salisbury. As time passed, however, and no news came from Mashonaland that any members of Major WILSON's party had arrived there, hope gradually died out, and it is now certain that the brave fellows stood by one another to the last and died together.

I have written this account of a very sad incident in the history of the colonization of inner South Africa, because I believe that, based as it is on the narratives of BURNUM, INGRAM and GOODING, the last men who saw Major WILSON and his men alive, it is a pretty correct version of what took place beyond the Tchangani River on the evening and night of the 3d and on the morning of the 4th of December last.

RETREAT OF MAJOR FORBES.

Of the simultaneous attack on Major FORBES's column, and of his subsequent retreat along the southern bank of the Tchangani River to Emhlangen, as well as of the dangers and hardships endured during the retreat by himself and his men, I will not attempt to give any account, because the story will be better told either by Major FORBES himself or by one of the men who were with him. In reply to the question: Why did not Major FORBES go to WILSON's assistance on the morning of December 4th? I will only say that at daylight on the morning of that day Major FORBES broke up his camp and was advancing towards the ford with that object when he was attacked by the Matabele, who for two hours kept up a heavy fire upon his party, killing and wounding eighteen horses and wounding four men. By the time that the enemy's fire was silenced, the river, which had been steadily rising, had filled from bank to bank, and was quite impassable with the Maxim guns. The river remained in heavy flood for three days, and so far from it having been the flooded condition of the river which prevented Major WILSON and his men from rejoining Major FORBES, and so caused the disaster, it is probably the depth of water in the river which prevented the Matabele, after having annihilated the small advance

party of thirty-two men, from crossing to the southern side, and elated as they were with success, overwhelming Major FORBES's entire force of 130 men.

* * * * *

THE SHOOTING OF THE MATABELE ENVOYS.

He then went at great length into the question of the shooting of the Matabele envoys at Tati, where he was present when the incident occurred. He said:

A lot of capital has been made by certain individuals out of the shooting of the Indunas, and the incident has been stigmatized as a foul and treacherous murder, and as a blot upon the escutcheon of England. I was at Colonel GOULD-ADAMS's camp when the affair happened, and I know exactly what occurred. Late in the afternoon of the day in question, when standing at the door of one of the houses belonging to the Tati Concession Company, I saw my old friend Mr. JAMES DAWSON ride up, accompanied by three mounted Matabele. Colonel GOULD-ADAMS was not far away, and he also saw the arrival of the men. As I had sent a letter to DAWSON only a few days before, urging him to try to get out of the country with FAIRBAIRN and USHER, and as he looked very much fatigued, my impression first was that he had made his escape, and that the three men with him were Matabele who had seceded from the King. One of these men -- namely, ISGUBUSGUBO, the King's brother -- I knew well, and went up and shook hands with him, but my only thought at the moment was to minister to the personal wants of my friend DAWSON, and I urged the latter to come into the concession and get a cup of tea. Thus I am to a certain extent responsible for DAWSON not having immediately reported the arrival of himself and the Matabele embassy to Colonel GOULD-ADAMS.

Whilst I was absent with DAWSON, the Colonel, seeing three Matabele all armed with rifles, looking curiously at the British camp, which was situated opposite the concession station and on the other side of the Tati River, sent Mr. TAYLOR, of the Tati Concession, who speaks the Matabele language fluently, to call them to him and ask their business. One of the envoys, MUNTUS, when asked by Mr. TAYLOR what he wanted, assumed a haughty bearing and spitting on the ground, said in a great rage, "What are the white men doing in my King's country?" He then turned to his companions and said, "Hau gubi lapa," meaning "things look nasty," and added, "Where are our horses? They have taken them away."

On this being interpreted, Colonel GOOLD-ADAMS, who it must be remembered, had no conception that the men were envoys from the King, thinking that if they were not watched they would very likely make a bolt back to Matabeleland and give notice of the approach of the white men, informed them that they would have to go over to his camp on the other side of the river, at the same time assuring them that they would be well treated, but should they attempt to escape they would be shot. The men made no remonstrance and did not ask to see DAWSON, but at once walked quietly across the river-bed to the camp, escorted by a corporal's guard of half a dozen men. When I came out of the house with DAWSON after an absence of half an hour we heard that the Matabele had been taken over to the camp under guard; DAWSON said he was sorry he had left them, for, as he had told me whilst we were in the house, the natives were envoys from LOBENGULA, and he himself had been sent in charge of them by the King. I said we had better go across at once to the camp and then you can report yourself to Colonel GOOLD-ADAMS. By this time the sun was down, but it was a bright moonlight night. DAWSON and I had just reached the bank of the Tati when we heard a shot from the direction of the camp, and on getting to the British quarters we were told that one of the indunas, after stabbing two men, had been shot in attempting to escape, while another had been stunned by a blow on the head from the butt end of a musket. The latter was still alive, and DAWSON went to see him, but found him to be unconscious. Dr. GARRAWAY was at once sent by Colonel GOOLD-ADAMS to attend to him, but by this time he had expired. What had happened was this: The three envoys were being escorted by the guard, but they were in no way bound and their limbs were unconfined, though of course, their rifles had been taken from them beforehand, and three men of the Bechuanaland Border Police with loaded rifles were walking on either side of them. Suddenly MUNTUS seized the handle of the bayonet hanging by the side of one of the troopers, drew it from its scabbard, and made a rush through the guards, stabbing right and left. Two troopers were stabbed, and MUNTUS had got quite clear of the guard, and was running towards the place where the horses were picketed. He was about twenty-five yards distant when one of the guards fired and hit him, the bullet passing clean through his body and wounding a Bechuana trooper in the foot. The second induna, INGUBU, a cousin of GAMBO's, made a rush to escape at the same time as MUNTUS, and, as he did so, one of the troopers who had been stabbed struck him a heavy blow on the back of the head with his musket. From this wound

he subsequently died. The old induna INGUBUNGUBO, the King's half-brother, was seized round the waist by Sergeant-Major HORE. He at first struggled violently, but finding no harm was intended him sat down and remained perfectly quiet.

On the following morning the induna resumed his journey to Palapwe with DAWSON. It is very evident from the above story that, although the death of the two men was a most deplorable accident, it was nevertheless an accidental occurrence for which no one can possibly be held responsible. It is only the persistent malice of certain individuals, as ignorant as they are malicious, that leads them constantly to misrepresent the matter and to brand honorable men as most infamous criminals.

THE CURB BIT.

BY CAPTAIN E. A. GODWIN, EIGHTH CAVALRY.

THE mechanical principle of the curb bit forms the subject of an article by Lieutenant GAYLE, Second Artillery, in the last number of the JOURNAL, in which he takes issue with some of the principles laid down by Major DWYER in his "Seats and Saddles." Doubtless Major DWYER is not precise in the use of mathematical and mechanical terms, but his meaning seems tolerably clear, and his conclusions are believed to be correct, and to be the logical sequences of the discussion. Whatever lack of clearness is noticed, is doubtless due to his having had in mind not only the mechanical action of the bit, but also the degree of pain inflicted by it. By considering these separately we may, perhaps, make the matter somewhat more clear.

In the first place argument as to whether the bit belongs, wholly, to the first or second order of lever is considered to be a waste of time. Since the weight to be raised and the fulcrum are both composed of living tissue, and a lever of either order would exert a pressure at both of these points, it is necessary to determine the degree of pressure at each, and this is to be done by regarding the bit as a lever of the first order acting at the curb, and as one of the second order acting on the bars. This is, in fact, what Lieutenant GAYLE has done in his article (page 42), notwithstanding his statement that "it will thus be seen that the bit cannot be other than a lever of the first order." The pressure exerted on the bars will be greater than that on the curb, and the difference will be equal to the power applied. Lengthening or shortening the branches of the bit will increase or diminish the pressure at both of these points, but will not change the difference between them, and this difference will also remain the same for any relation between the upper and lower parts of the branch.

If, for instance, the power applied be ten pounds and the proportion of the upper and lower parts be one to two, then the pressure at the curb will be twenty pounds, and that at the bars will be thirty pounds. In like manner if the same power, ten pounds, be applied, and the proportions be one to ten, the pressure will be respectively one hundred pounds and one hundred and ten pounds, the difference always remaining equal to the power. This would seem to show that the relation between the upper and lower parts should be determined by some other consideration besides pressure. The consideration which will really determine the length of the upper part of the branch will be the place of the curb—it should be of that length which will permit the curb to lie in the chin groove, with the least tendency to mount up out of it, and at the same time will keep the bit from falling through without unduly tightening the curb.

Now considering the mechanical action and the *painful* action together, it seems evident that if the effect of the curb is greater than that on the bars, the motion of the horse will be the same as would have been produced by a lever of the first order, simply: in other words, he will stick out his nose and lean on the hand. This result is described by Major DWYER, when he says that "we obtain the action of a lever of the first order." Lieutenant GAYLE calls this statement "wholly erroneous"; but, except in a strictly technical sense, it does not appear to be so. The effect produced at the curb is in a direction contrary to what we desire: that on the bars is in the desired direction; consequently we seek to reduce the former to its lowest limits, and our experience tells us that this may be done by adjusting and proportioning the curb according to Major DWYER's directions, which Lieutenant GAYLE calls "common-sense statements about the curb," and "an interview with the horse" will not be necessary. It is even conceivable that, with a moderate pull on the reins, such as would commonly be necessary in controlling the horse, the *painful action* at the curb might be reduced to zero.

Lieutenant GAYLE quotes the statement in Ordnance Memoranda No. 29, to the effect that the bits are numbered according to their severity, which is determined by the height of the port, and declares that "comment on such an absurdity is a waste of time." Major DWYER should have credit for his share in this "absurdity," also, for he says on page 176 of "Seats and Saddles," in describing some mouth-pieces there illustrated: "Fig. 13 shows a succession of mouth-pieces of the forms now generally adopted, beginning with the lightest: that is to say, the one whose pressure is almost entirely exercised on the tongue, and proceeding onward with an increase

of port or tongue freedom, to the very sharpest it is advisable, or can ever be necessary, to use, namely, the one in which the height of the port is equal to the width." Since the tongue is less sensitive than the bars, it would follow that the bit which took all pressure from the tongue and put it on the bars, would be the sharpest for a given diameter of mouth-piece, and numbering them according to the height of port does not appear to be more absurd than numbering with regard to any other single dimension, that of the length of the mouth-piece, for instance, which is the present mode of doing it.

As regards the pressure on top of the head, the figures given by Lieutenant GAYLE are doubtless correct, if all the effect of a pull on the reins is transmitted to that point; but such is hardly the case. He is doubtless aware that the present Shoemaker bit is a modification of its first form, which had a hinge at the mouth-piece on each branch, in such manner as to allow free movement of the lower part of the branch, and also that part which carried the curb, but allowed the cheek-piece to remain undisturbed by a pull on the reins. The same effect is claimed for, and appears to be, to a certain extent at least, produced by the large ring into which the cheek-piece is buckled, and the manner of attaching the curb in the present Shoemaker bit; in fact, the removal of pressure from the top of the head was the chief claim made for the Shoemaker bit, and was the chief purpose of its inventor. If any allowance was made for this action in the calculations mentioned, it does not appear, though actual experiment, instead of theoretical calculation, would doubtless show that the pressure is greatly diminished. The Dwyer bit has similar action, but to a much less extent, because the ring is much smaller, and the curb is attached in a different way.

The present writer does not remember to have seen a case of poll evil among cavalry horses for many years, and is inclined to think that it is not often met with among them. If the pressure on top of the head is as great as calculated by Lieutenant GAYLE, cases of poll evil would be much more frequent than they are.

The dimensions, therefore, which will affect the severity of the bit are: the total length of the branch, the height of the port, and the diameter of the mouth-piece. Of course there are other dimensions which are variable, and which affect the fit of the bit. It is not, if the foregoing be correct, necessary to vary the relation between the upper and lower part of the branch, as suggested by Lieutenant GAYLE; and, since it is determined by experience that the total length of branch desirable is about 5.25 inches, and that

1.75 inches is sufficient length for the upper part, to prevent the bit falling through, these dimensions may reasonably be regarded as fixed. It is surely not desirable to introduce any more variables than are necessary.

The mouth-pieces for cavalry bits may be made of uniform diameter, and, in fact, are made so, as issued to our cavalry. The same is true with regard to width of port. There remain, then, two dimensions which should be variable: in other words, of which different sizes should be issued, viz: length of mouth-piece and height of port. Each length of mouth-piece should have varying heights of port. Major DWYER says of the height of the port that no rule can be given, "this being precisely the most variable dimension of all." In our present bit all ports are alike. It is not considered desirable to make the fitting of bits to cavalry horses too complicated a matter by having too many variable dimensions, thus requiring the manufacture and issue of a large variety of bits. The two dimensions named above will, it is believed, afford a sufficient variety to permit all horses to be reasonably well fitted with bits suitable to each, as to size and severity.

PROFESSIONAL NOTES.

THE AMERICAN SYSTEM OF CAVALRY IN EUROPE.

The maneuvers, last fall, both in Austria and Germany, show the antiquated ideas still underlying the use of cavalry, and limiting its action mainly to the shock and *arme blanche*. In the German service, it is true, the "American system" has been lately introduced, too late, however, for these maneuvers.

The Austrian maneuvers were conducted on an unusually large scale, two armies of 50,000 men each, operating against each other. On the day when the reconnoitering and screening service of the cavalry divisions began, the heads of the hostile armies were about sixty miles apart, their rear about 100 miles. By evening of the second day each army had ascertained the location and composition of its opponent with sufficient accuracy for forming its plans.

The cavalry division of the North Army consisted of twenty-nine squadrons with five pioneer platoons (the Austrian cavalry regiment consists of six squadrons and one pioneer platoon), two rifle battalions and two horse batteries. The squadrons averaged 135 sabers. This cavalry division moved about twenty-five miles ahead of its army, and detached on reconnaissance five officers' patrols of one officer and four men each, and six reconnoitering detachments consisting respectively of ten men, one platoon, one squadron, one squadron with pioneer platoon and telegraph patrol, one and one-half squadrons and one-half squadron. Five of these reconnoitering detachments were to remain in constant touch with the enemy. These bodies, in rear of which the main body of the division was held well in hand, covered a front of something like forty miles, and furnished ample and accurate information of the enemy. Upon the near approach of the opposing armies, this cavalry division withdrew to the eastern flank, where the ground was favorable for cavalry action. The screen it had formed was penetrated in several places by the enemy, who was no doubt largely favored by the hilly and rolling character of the ground, diversified by many woods and watercourses.

That part of screening duty which relates to reconnaissance was

well performed by this division: but in view of the extent of front to be covered to prevent the enemy from penetrating the screen, the detachments were too few, and there does not seem to have been any particular system of screening, such as we are taught. The main body of this cavalry division advanced to and established itself in Guens, which formed a defile, the possession of which would be an advantage to either army.

The cavalry division of the South Army consisted of thirty-six squadrons, four pioneer platoons, two horse batteries and two rifle battalions. Its employment by the commander of the South Army was less in accord with our ideas on the use of the cavalry division, than that of the North Army. For the purpose of reconnoitering, it sent out one officers' patrol, whose duty it was to locate and track the hostile cavalry division, and three reconnoitering detachments, consisting respectively of one-half squadron, one squadron, and one squadron with telegraph patrol; each detachment had assigned to it a certain front on which to conduct its reconnaissance.

Some good riding was done on this duty. One squadron covered sixty-five miles in one day's march, one platoon of the same squadron made eighty-five miles, and a courier from this platoon made one hundred miles in twenty hours on the same horse.

The main body of this large cavalry division clung close to the front of its army; no effort at screening, as we understand it, was made, for the detaching of two and a half squadrons cannot be called screening. To prevent the enemy's reconnaissance, several small, mixed detachments, advance guards in fact, were established at different points in front and flank of the South Army. The information gathered by the cavalry of this army, which, as we have seen, was without the cavalry screen, was less complete and definite than that furnished by the North Army by its cavalry division.

According to our notions, both cavalry divisions should have made a rush for the important defile of Guens and fought for its possession. In that case the cavalry division of the South Army, being superior in strength, would have driven the North army away, instead of allowing the latter to use it as a center from which to reconnoiter the screenless South Army, one day's march distant, and advancing upon the same jointly with the main body of the army, in order to compel it to abandon the place.

As the opposing armies approached each other, the south cavalry division also withdrew to the east flank, and the action of the two cavalry divisions thereafter consisted in frequent combats in covering the flanks of their armies. After the cavalry divisions had thus uncovered the armies, each corps reconnoitered its own front by its divisional cavalry, consisting of half a regiment (three squadrons) to each infantry division. Mixed detachments were used by both armies in protecting the western flank, where the ground was mountainous and close.

The tactical action of these cavalry divisions is illustrated by the collision which took place on the first day of actual hostilities. The

north cavalry division advanced south from Gneus, and perceiving the approach of the south cavalry division, followed closely by the infantry columns, made dispositions to delay and observe the enemy; the rifle battalions were ensconced in copses flanking the open ground over which the hostile cavalry must advance, and the horse artillery was brought into position. The advance of the leading regiment of the south cavalry was met by a regiment of the north cavalry. A reconnoitering detachment of the North Army, consisting of one squadron which happened to be in the vicinity, joined in the charge of its own accord, taking the south regiment in flank, which, having moreover been under the fire of the horse artillery of the north cavalry, was defeated. The north cavalry, at this time, seeing plainly the advance of the columns of the South Army, was preparing to withdraw, when the south cavalry division formed for the charge, three of the remaining five regiments in first line, one regiment in second line to the left rear, and one regiment in third line to the right rear. The north cavalry promptly accepted the challenge and wheeled about. In the ensuing charge the south cavalry was not supported by its second and third lines, came under flanking fire at close range from the rifle battalions in the copses, and being also charged in flank by one of the northern regiments and in rear by the reconnoitering detachment above referred to, was defeated. The pursuit was checked by the fire of a dismounted squadron ensconced in the edge of a copse, the fire of the two rifle battalions, the fire of the approaching heads of columns, and a charge by the divisional cavalry of the Seventh Infantry Division, which had hurried across country in support.

The action of the cavalry division and the use of their rifle battalions throughout the maneuvers were similar, and this short statement will suffice to give an idea of the Austrian views on the use of cavalry. Recognizing the necessity of fire action on the part of cavalry, the Austrians have armed it with the carbine, but this cavalry does not seem to feel as yet independent enough to rely on its own strength, and is reinforced by two rifle battalions, foot soldiers, which form part of the cavalry division. The combination of infantry with cavalry may sometimes prove satisfactory when the cavalry division remains more or less stationary, as on the day of battle, when it protects the flank of its army, but it is evident that this combination must paralyze the independent action of cavalry, which is its principal function. It is equally patent that cavalry which is armed with the carbine, but does not derive from it the full benefit of the power it conveys, and fails to feel totally independent, is not abreast of the cavalry "that can fight anywhere except at sea."

The tactical use of the rifle battalions is illustrated in the cavalry engagement described. These cavalry riflemen are concealed, and the enemy led on to charge over ground where he must come under flanking or cross fire at short range. Nothing can be urged against this in itself, for surely nothing is better calculated to take the edge off a charge and break its cohesion than effective flank or cross fire. But we should expect the cavalry to be able to itself deliver that fire where it is called for.

It would almost seem as though the Austrians were in the habit of applying former experiences without due consideration of the attending circumstances, and therefore in a one-sided manner. In 1859 they were much struck by the impetuosity of the onsets of the French infantry, and immediately concluded that the rapid advance with the bayonet in close formation was the safest and only way to counteract the long range fire of the rifle. Without duly weighing the fact that they were confronted by the breech-loader, they applied this method in the War of 1866, only to have their infantry shattered by the withering fire of the breech-loader. In the same war some Austrian cavalry, advancing in pursuit, came—probably by accident—under the fire of hostile infantry at close range, and it seems not improbable, that, based on these occurrences, they have adopted a new article of faith in their military creed to be adhered to unbendingly until proven untenable in the next war.

At any rate, it is evident that they do not have a very clear idea of the object of the carbine in the hands of the trooper, nor of the power of cavalry that can wield the saber and carbine with equal skill.

From notices in military periodicals it appears that this combination of foot soldiers with cavalry was also tried lately in the French maneuvers. Although it would seem generally deprecated in the German service, there was one instance in the maneuvers in Lorraine last fall where some infantry was attached to cavalry one day. In this case, however, the army corps followed close on the heels of that particular detachment.

The last German maneuvers plainly show the necessity for cavalry to be able to fight on foot, and the superiority in battle as well as in reconnaissance of cavalry thus trained over cavalry relying almost exclusively on the saber and lance.

In one instance a corps of three infantry divisions marching northward encountered a corps of two divisions in position with a front of about three miles covering a pontoon bridge over the Rhine. The commander of the south corps intended to engage the enemy with his center first, then with his left, and while thus holding him to his position, to turn his left with a strong column. The reconnoitering cavalry did not resort to dismounted fire action, failed to develop the enemy and locate his left accurately. In fact, it reported that a particular portion of ground on his left was held by small detachments, when in fact an entire infantry division, concealed by the rolling ground, was posted there deployed and ready for attack. In consequence the turning column brought up against this division was surprised and defeated; the whole plan of the commander of the south corps was upset, the turning column which was to engage last became engaged first, and it and the other parts of the corps were defeated in detail.

This instance shows plainly that cavalry when opposed to an opponent skilled in the use of ground, must fight on foot, and by its fire action force the enemy to show his hand, if it wishes to furnish accurate information of the extent of his position. As it was, two

colonels of cavalry were retired on small pensions, a sacrifice it would seem, to an antiquated system which even severity can not make to fit modern requirements.

In another instance, where two corps operated against one another, the one on the offensive was greatly superior in infantry, the one on the defensive had a cavalry corps of twelve regiments. The intention of the offensive was to defeat the opposing corps and cut off its retreat, and its movements were conducted with great skill, compelling the defender to put his last man in the line when the offensive had still one-and-one-half divisions to execute a turning movement. As these last named troops deployed to force the enemy from his line of retreat, they were charged in flank and rear by the cavalry corps. The charge, though made after a gallop of over two miles, was well executed, the squadrons being well in hand to the last, but it is generally accorded a failure, owing to the fire from the intact infantry and the position taken by part of the infantry on ground over which the cavalry could not advance, it being in fact compelled to ride along the front of this infantry without being able to touch it. Had the cavalry corps dismounted for fire action, it might at the very least have considerably delayed the turning movement and produced a greater effect with less loss. It would seem that this charge was useful merely as a matter of instruction in the tactical handling of large bodies of cavalry.

These occurrences have doubtlessly contributed their share toward the overthrow of the old school and the adoption of the American system. The results therefrom remain to be seen in the maneuvers of this or next year.

The present equipment of the German cavalry is not at all suited for dismounted fire action. In the first place, on dismounting the lance has to be disposed of; if there be a way of doing this in a convenient manner, it will still prevent the led horses from being maneuvered with the same ease as ours. Another awkward feature is the manner in which the carbine is carried. It is strapped to the off holster, and rides almost horizontally against the trooper's thigh. In mounting he has to rise straight up in the stirrup and insert his foot in the space between the saddle and carbine, and in dismounting a similar inconvenience is encountered, to which must be added the fact that the saddle turns more easily than ours. To apply the American system with success, changes in the German trooper's equipments seem indispensable.

We frequently express surprise at the delay with which the European cavalries are coming around to the American system. The obstacles in the way of its adoption are quite formidable and both moral and material. Our system requires both horsemanship and marksmanship.

The former will always be found where horses are plentiful and, incidentally, the roads are poor. We have a greater number and better quality of saddle horses than any other civilized nation, and also poorer roads. As a consequence the percentage of Americans that do not know how to ride, is small. So far as horsemanship is

concerned, there would be little delay in rendering mounted bodies newly raised, in case of war, efficient. These conditions do not obtain in Europe. It is true, the Cossacks, born on horseback as it were, are distinguished for their riding, and so are the Hungarians, which is again attributable to a plentiful supply of good horseflesh as well as to the light build and nimbleness of the riders. But as a general rule this does not apply to the continent, and more particularly to its central portion. The supply of horses is limited, and skill in riding is confined to those that are well off. It follows that the average recruit joining a cavalry regiment knows less of horses and of riding than the average American, and that more time must be devoted to his instruction and training. Not only that, but the recruit, as in the German army for instance, is frequently assigned to the cavalry, because the conformation of his body unfits him for the heavy foot marches required of the infantry. The average European cavalryman is, therefore, far from being a fine rider, and great pains are taken to make up for his deficiencies by the most perfect training of the horse.

In regard to marksmanship the conditions in Europe are equally unfavorable as compared with ours. I dare say there is no American who does not know how to use fire-arms, while in Europe but a small percentage of the population ever handles them, and they can not begin to compete with us in this respect. Again, they require more time and instruction than we do. The financial part of the question must also be considered. To provide target ranges and materials, as well as ammunition, for an extensive course of instruction in marksmanship, is no small expense for a State maintaining a cavalry force of sixty or seventy thousand men. Moreover, in a densely populated country, ranges cannot always be secured in convenient vicinity to the many cavalry garrisons. This, for instance, is one of the questions of the day with the French cavalry.

All these difficulties, however, are not insuperable for those nations whose political existence depends on their armies; by far harder to overcome are the prejudices of the old school of cavalry. The defects of its system, limiting the tactical action of cavalry to the shock and *arme blanche*, became painfully patent to the Germans in the war against the Republic in 1870-71, when the Uhlans were glad to arm themselves with a captured chassepot. Since that war the military powers of the old continent have added the carbine to the armament of nearly all the cavalry, but judging from the results of the last maneuvers, their tactical training does not seem to have undergone a corresponding change. Old preferences, old prejudices, even in the most ordinary things of life, are not easy to overcome. The character of the European is essentially conservative, and we should not be surprised at the great resistance offered by the prejudices of a body of 70,000 cavalry to a total revolution of their tactics. How difficult it is to overcome the prejudices of the old school is exemplified in the German cavalry. Its knowledge of our cavalry in the Civil War does not seem to have been derived, at first, from the best authorities, but the new school nevertheless perceived the

soundness of our principle that good cavalry must be able to fight equally well on foot and on horseback. This new school has persistently advocated the adoption of our system, adducing irrefutable proofs of its soundness, as exhibited in the writings of von SCHMIDT, the anonymous author of the work entitled "The Armament, Training, Organization and Employment of Cavalry," and others. It is only a few months since that it has so far overcome blind prejudice as to secure the adoption, experimentally, of our system. If it should be definitely adopted, the other military powers must follow suit if they wish to meet their opponents on equal terms.

These prejudices are rooted in the traditions of the arm, and in the history of glorious feats of arms on many fields, and in so far as they represent homage paid by a nation to the valor of her sons, are not only pardonable but eminently proper; but they become inexcusable and positively vicious when they assume such a character as to render this old school deaf to reason and blind to the total change of conditions and requirements under them of the modern cavalry, whose efficiency, until something better turns up, must be measured by the standard of the American cavalry in the Civil War.

CARL REICHMANN,
First Lieutenant, Ninth Infantry.

NEW METHOD OF LOADING THE REVOLVER.

EDITOR CAVALRY JOURNAL:—Some of our cavalry troops have now been equipped for more than a year with the new Colt's revolver, caliber .38. Paragraph 166 of the Cavalry Drill Regulations having become obsolete, it was hoped that before now a suitable amendment would have been issued by authority, but instead, a report upon the advisability of changing the construction of the revolver was recently required of cavalry officers. Having observed the extreme clumsiness with which the operations of extracting the shells and loading the revolver were performed by enlisted men, even when dismounted, the following system was devised, and after a little practice, was found to be entirely satisfactory:

"166. *Load.*—Being at raise pistol, bring the right hand to a position about eight inches in front of the right breast; drop the muzzle of the pistol to the left—slightly to the front—loosening the grasp on the butt for this purpose; at the same time place the forefinger back of the guard and the end of the thumb on the cylinder latch, the barrel being horizontal and the pistol turned with its side almost horizontal. Press back the cylinder latch, lower the pistol, turning the wrist to the left, grasp the base of the barrel with the thumb and forefinger of the bridle-hand, trigger guard up, muzzle pointing to the left and downward at an angle of about thirty degrees, the cylinder resting on the other fingers of the bridle-hand. Insert cartridges into all but the lowest chamber, push the cylinder back into place, the hammer resting on the empty chamber, grasp the butt with the right hand, and raise pistol. In case the cylinder does not readily drop out of place on releasing the latch, lower the pistol and assist with the forefinger of the bridle-hand. Load is similarly executed from other positions of the pistol. To eject shells, the pistol being held in the bridle-hand as before described: Turn the bridle-hand, raising the muzzle so as to bring the barrel nearly vertical; press on the end of the

ejector rod with the right thumb and receive the shells in the right hand below the cylinder. Individual troopers will be required to practice loading at all gaits."

The advantages of this method will be obvious after a few minutes' practice; and its use, mounted, has convinced me that the present revolver, breaking to the left, is more convenient than one breaking to the right would be, for the following reasons:

1. The shells are more readily extracted and saved.
2. The revolver is more securely held with the reins in the same hand, the cylinder being practically immovable, and loading from the belt or pocket, at rapid gaits, much more secure.

FORT RILEY, KAN., JUNE 6, 1894.

F. T. DICKMAN,
First Lieutenant Third Cavalry.

ALUMINIUM HORSESHOES.

Major C. C. Carr, Eighth Cavalry:

Regarding the set of aluminium horseshoes given me by you for trial, I have the honor to report as follows:

These shoes corresponded in size nearly to the ordinary No. 3; they were about half an inch in thickness. In the toe of each front shoe was set a narrow piece of steel about an inch and a half long, to prevent too rapid wear. The front shoes weighed seven and one-half ounces each; the hind shoes six ounces each; making the total weight of the set twenty-seven ounces. The shoes, both front and hind, were pierced for seven nails each—four on the outside, three on the inside—each nail having its head countersunk separate from the others, instead of a continuous groove. The width of web was nearly one inch, and the shoe was not bevelled on either face.

The shoes were on the 22d of February put on a troop horse which weighed about 1,000 pounds. On March 22d the shoes were reset. On April 21st one of the hind shoes broke near the toe, and the whole set was removed. During the two months the horse was ridden about 140 miles, not including drills, parades, and the ordinary garrison duties. The shoes are much reduced in thickness, of course, but have lasted better than was expected. The front shoes could be used a little longer. The pieces of steel set in the toes of the front shoes added greatly to their wearing qualities; they were worn off at the toes until the pieces of steel were reached, and further wear in that direction prevented. The hind shoes, which had not these steel pieces set in, wore quite thin at the toes, and as stated, one of them finally broke; the other was broken in taking it off.

It would seem from this test that, with the toes protected in the manner described, the shoes would last about two months in ordinary garrison use, and probably half that time in ordinary field work; that is, work over average ground.

The saving in weight is very great, the ordinary No. 3 iron front shoe weighing about seventeen ounces, and the hind shoe fifteen and

one-half ounces; making sixty-five ounces per set, as against twenty-seven for the aluminium. I return to you herewith the worn shoes, except half of one hind shoe, which was lost.

Very respectfully,

E. A. GODWIN,
Captain, Eighth Cavalry.

FORT LEAVENWORTH, KAN., April 25, 1894.

ONE WAY OF CONDUCTING A FORCED MARCH.

On April 14, 1894, being in camp eight miles from Gilroy, Cal., I was ordered to take a detachment of twenty men and make a forced march to the Presidio of San Francisco, Cal., in order to take part, as escort, in the funeral of that gallant soldier, the late Captain A. E. Wood, Fourth Cavalry. The distance was ninety-two miles, and it was accomplished in twenty-three hours and a half without injury to men or horses. As the method pursued in the march had some unusual features, a short description might interest the readers of the JOURNAL.

The detachment, consisting of three non-commissioned officers and seventeen men, left camp at 1:45 p. m., April 14th. The men carried one day's cooked rations in the saddle pockets. Their equipment consisted of carbine and saber, a saddle blanket and bed blanket, one overcoat, and the other ordinary articles of saddle equipment except side lines, lariat and canteen. Three miles from camp the horse of one of the non-commissioned officers stumbled, cut his knee, and was sent back, reducing the detachment to one officer and nineteen enlisted men.

In order to arrive at the Presidio in time to prepare for the funeral it was determined to make the whole distance, ninety-two miles, in two marches, arriving as early as possible the next day. On leaving camp a long swinging trot of about nine miles an hour was taken. The men marched in columns of twos, the members of each two to avoid dust, riding on opposite sides of the road. They were instructed to select the soft parts of the road in order to avoid jarring and pounding the horses' feet too greatly. To insure a uniform gait throughout the column, the detachment marched in two squads, with a distance of from four to ten yards between the first and second squads, maintained by the leader of the second squad, who was required to keep a uniform gait. This prevented the alternate urging and checking of the horses in rear, which is so common on the march, especially at the trot, and so wearisome to the animals in rear. This fast trot was kept up for twelve minutes. The detachment then dismounted, and leading their horses, marched on foot for twelve minutes, traveling nearly, if not quite, four miles an hour. The horses were then ridden at a fast trot twelve minutes, and then led for twelve minutes as before.

This length of period was adopted because it was found during the first day's march at least to be the best suited to the powers of men and horses. At the end of twelve minutes' fast trot the horses would

flag a little. At the end of twelve minutes' leading the men were slightly tired, but the horses had rested and had recovered their breath and traveling power. On the second day these periods were reduced to ten minutes' trot and ten minutes' leading. While the walking in the end made some of the men a little sore-footed, they arrived each day less stiff and fresher than if the same time had been spent continuously in the saddle.

The weather was hot and the horses naturally needed water often. Watering troughs were frequently met with along the road, and if not too much heated the horses were watered, generally after a spell of leading. But the quantity of the water was restricted, and on no occasion were they allowed to take more than eight gulps of the liquid, the commander of the detachment personally making sure of this. These halts for watering lasted only about three or four minutes each. No other halts were made, except when dismounting, which was done very quickly.

Proceeding in this manner, the detachment arrived at Santa Clara, forty-two miles, at 8:30 p. m., having made the distance in six and three-quarter hours, an average of 6.22 miles per hour. The horses seemed in no way fatigued. They were lodged in a stable. About an hour after arrival they were watered and fed and groomed, particular attention being paid to rubbing down their legs.

On April 15th, the horses were watered, fed and groomed at 3 a. m.; the detachment started at 4. The horses moved freely without stiffness. The march was continued in the same manner, trotting and leading alternately. Towards the end of the march a violent head wind, almost a hurricane, was encountered. Newspapers, the next day, rated it at sixty miles an hour. In spite of this, however, there was little fatigue shown by the horses. The Presidio was reached at 1:15 p. m., twenty-three and one-half hours from the time of starting from Gilroy, and nine hours and fifteen minutes from Santa Clara. Distance from Santa Clara, fifty miles; average rate per hour, five and four-tenths miles. Leaving out halts and the rest at Gilroy, the march from Gilroy had thus been performed in fifteen and one-half marching hours, or at an average rate of five and nine-tenths miles per hour for the ninety-two miles. Of this distance, the men, if we estimate their rate of marching on foot as three and three-quarters miles an hour, had led twenty-eight miles, marching on foot.

The horses, on arrival, were put in a stable and groomed for forty minutes. Particular attention was paid to hand rubbing, as their legs showed a tendency to swell. During the next two days this hand rubbing was continued, each horse, besides the regular grooming, having his legs rubbed down four or five times a day. No grain was allowed the horses, but they were fed on bran mash, to obviate a tendency to feverishness that was exhibited by some of them.

The day after its arrival, when the detachment turned out for the ceremony, the horses looked so well and acted with so much spirit that it was difficult to persuade bystanders that these same horses had just made ninety-two miles in less than twenty-four hours.

On April 18th, the detachment commenced its return march to Gilroy, arriving there April 22d; horses all in fine order.

It is believed that this method of making a forced march is particularly applicable to small detachments, as bodies not larger than a troop. With larger commands, modifications may be necessary, and it is certain that the same rate of speed could not then be kept up without injury to the horses. But the principle of riding at a fast trot, and leading at a fast walk, is, it is believed, a good one. While it requires more exertion on the part of the man, it is better for him in the end, and certainly better for the horse. Give him a good, level, not too dusty road, with plenty of water along the route; cool weather; a start after mid-day; good stabling the first night out; and it is moderately certain a troop of cavalry, marching in this way, could make 100 miles in twenty-four hours without injuring an animal, and probably in no other way could it be done with so little expenditure of vital force of man and beast.

GILROY, CAL., May 25, 1894.

JAMES PARKER.
Captain, Fourth Cavalry.

BOOK NOTICES AND EXCHANGES.

MAXIMS FOR TRAINING REMOUNT HORSES FOR MILITARY PURPOSES.
By Lieutenant J. Y. Mason Blunt, Fifth U. S. Cavalry. Published by D. Appleton & Co., New York.

Lieutenant Blunt's book has been so frequently and so favorably noticed already by the service and many other journals of the country that it is too well known to need any further commendation.

Its distribution to the cavalry regiments of our army has enabled our mounted officers to familiarize themselves with its contents, and to put into practice many of the suggestions contained therein.

Lieutenant Blunt having enjoyed exceptional advantages for the acquisition of the principles governing the proper training of remount horses, what he has to say upon the subject is of a decidedly clear and practical nature. The book is gotten up in excellent style as regards typography, illustrations and binding.

MILITAER-WOCHENBLATT.

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A Competitive Ride of Russian Guard Cavalry Officers. No. 38: Causes of the Victories and Defeats in the War of 1870. No. 39: Garrison Libraries. No. 41: Mounted Orderlies for Infantry. Penetration of the French Lebel Rifle. No. 42: Transformation of the Military School at Saint Cyr. No. 43: The New Cavalry Drill Regulations, Parts I. and II. No. 44: The New Cavalry Drill Regulations, Parts III. and IV. No. 45: Changes in the Combat Regulations of the French Infantry. A Birds-Eye View of the Regulations, Instruction and Exercises of the French Cavalry. No. 47: The Results of Horse Breeding in France in 1892. No. 48: The First (Royal) Dragoons. The Cavalry School of Saumur. No. 49: Colombey Nouilly. Military News From Russia. No. 50: Colombey-Nouilly (concluded). No. 51: Notes on the Psychology of the Great War; a War Without Any Chances. No. 52: Diminution of the Ammunition Carried by the Man.

JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION

January, 1894: The Action of Cavalry and Horse Artillery Illustrated by Modern Battles, by Major E. S. May, R. A. The Rise, Decay and Revival of the Prussian Cavalry, by Captain F. N. Maude, late R. E. The Effect of the Lee-Metford Bullet on the Bones of Horses, by Veterinary Captain F. Smith, A. V. D. February: A Précis of the History of the First Regiment of Massachusetts Cavalry Volunteers During the American Civil War, compiled by Captain R. A. Henderson. The Manchester Regiment, March: The Soldier's Sore Foot, by Surgeon Captain W. C. Beaver. Scots Guards. The Losses of Horses in War, by Veterinary Captain E. Smith. The Wars of Frederick the Great, by the German General Staff: Précis of the Introductory Chapters, by Captain Maude, late R. E. June: Machine Guns with Cavalry, by Captain W. Anstruther Thunson. Royal Horse Guards. May: The National War on the River Loire in 1870, by Major W. Western.

REVUE DU CERCLE MILITAIRE.

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FROM THE MILITARY INFORMATION DIVISION, WAR DEPARTMENT, A. G. O.

No. 2: The Organization of the German Army, by Major Theodore Schwan, Assistant Adjutant-General, U. S. Army. No. 3: The Organized Militia of the United States.

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A Review of Aldie, by Captain George N. Bliss. The Fifth New York Cavalry in the Valley, by F. S. Dickenson. Fifth New York Cavalry.

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Supply of Ammunition in the Field, by Major E. C. Hawkshaw, R. A.

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THE FIRST CAVALRY RECRUITING SERVICE IN IOWA.

BY FIRST LIEUTENANT JACOB G. GALBRAITH, FIRST CAVALRY, U. S. ARMY.

IN the fall of 1892 the First Regiment of Cavalry was badly in need of recruits, and they could not be obtained from the Cavalry Depot. In fact, at that time and under the conditions then existing, the General Recruiting Service was unable to meet the demands made upon it. Discharges had been made easy, labor found ready employment, times were good, and service in the Regular Army was unpopular.

More especially was the cavalry in reduced straits. The recruiting officers for the mounted service were in the large cities. It was a fact then, and is now, that the average class of young men who were likely to apply at the permanent recruiting offices were not suitable for cavalry.

Among the industrial classes in eastern cities horseback riding is not practiced. These people do not own or keep saddle-horses, and the young men do not acquire any knowledge of their proper care and treatment; much less do they possess that fondness for and appreciation of a good mount, without which qualities a man is out of place in the cavalry service.

As a general rule, the best riders are those who have done a great deal of riding in their boyhood. Those who grow to man's estate without "horsey" associations are not considerate of a horse's needs, and the horse suffers from their thoughtlessness, ignorance and neglect. Such men, if they do join the cavalry, soon discover their mistake, and so do their horses.

It may be readily understood, from the foregoing, that our cavalry was not only short of men, but that it contained many who should never have been accepted for the mounted service.

In addition to suffering from the general scarcity of recruits, the conditions of service and of locality were such that, at the period mentioned, men sought service in other regiments in preference to the First Cavalry.

The troops which suffered the heaviest losses during that summer of 1892 were those at Regimental Headquarters, Fort Grant, Arizona. Coming from the cold climate of Montana in the spring, the soldiers found a desert, parched by an unprecedented drought. Target practice was held in June, July and August. (The thermometer on the range often registered 130° Fahrenheit.) Fatigue duty was oppressive. What wonder if officers and men became discontented? Some of the former sought special details, and there was soon a marked scarcity of duty officers. The enlisted men departed on furloughs or purchased their discharges, or took French leave. As before stated, the Cavalry Depot could not supply the needed recruits. The War Department was experimenting with regimental recruiting, with doubtful, if not discouraging, results.

The system of special regimental recruiting, and the instructions for its government, as set forth in Circular No. 7, series of 1892, from the Adjutant-General's Office, was not made applicable to the First Cavalry. Its object was defined to be "to furnish to regiments serving in the more settled part of the country the opportunity of recruiting their ranks, by means of traveling recruiting parties from the community surrounding or of easy access to their posts." Localization of regiments was not contemplated by those instructions, and does not appear to have been regarded with favor in our army, although some system of territorializing regiments was in vogue in European armies. However, their system, by which each regiment is recruited within the district in which it is permanently stationed, is not generally applicable to our army. Other considerations determine the stations, of our cavalry especially.

The administrative officers of the First Cavalry were not indifferent to the state of affairs, nor slow to perceive a remedy. A

project was outlined for a First Cavalry recruiting service, with a view not to mere temporary relief, but to insure to the First Cavalry, for all time, a reliable supply of recruits. The Colonel asked for and was granted permission from the War Department to try the experiment for ninety days. That was in November, 1892. The work is going on to this day, with satisfaction to the regimental commander and the War Department. Nearly half of the enlisted men at Fort Grant are Iowa recruits. It is believed that the First Cavalry recruiting service in Iowa has justified the hopes of its projectors, and it is reasonably expected that it will be made permanent.

This will mark a new departure in recruiting, so far as the United States regular army is concerned, although the methods of raising volunteer regiments might have suggested its applicability. The general problem of recruiting is more difficult under a free government than a monarchical one. It has been authoritatively asserted that republicanism and military efficiency are irreconcilable. Certain it is that public sentiment in this country will not tolerate the arbitrary methods characteristic of foreign armies, nor can we subject our recruits to the severe training exacted in those services.

The Germans make efficient cavalry out of raw material such as we would reject. "Those recruits whose physical conformation renders it unlikely that they will be good marchers are told off to the cavalry; and no particular attention is paid to the wishes of the applicants. Long bodies, short legs and round thighs procure exemption from infantry duties."—(MAUDE.) The term of service is but three years in the German cavalry, yet they make efficient cavalry out of such material in that short time.

Our recruiting methods give better material, and it is the duty of the officers to manufacture the finished article out of the raw stuff. Since recent legislation has practically reduced the term of enlistment to three years, we believe that the sooner the recruit joins his regiment, the better.

The Inspector-General of the army says: "It is evidently the duty of the regimental officers to train and instruct their own men from the very first stages of their military career. Fundamental errors occur from any other practice. Training elsewhere, no matter how systematic, is like the work of a stepmother." And again: "Perhaps the best way to guard against filling the army with waifs and strays is to accept the recruit immediately at his own home, and place him directly in his permanent military family (which is the company) and thus avoid subjecting him to the outcast feeling of loneliness that an unassigned recruit receives."

One more quotation from his annual report: "The regimental recruiting has produced some good results, even in the tentative and perfunctory form yet given it. Why should not the regimental officers be able to obtain as good and acceptable recruits when working for their own regiment as when working under a bureau? The good results already attained show that better are possible. But if it be thought inadvisable, for any cause, to extend the sphere of regimental recruiting, then I recommend that the companies of the permanent party, at the general depot, be replaced by detailed companies of infantry and cavalry, so that every recruit enlisted for the army may be assigned to regiments, and the army supplied with the best men. The beneficial effect on the moral of the army, were this change to be made, is prophesied with fair accuracy, and it is safe to predict the disappearances of abuses which have prevailed for years at the depots, whereby recruits have been injuriously affected, and an alteration in the tone of every detachment of recruits sent to companies, which would insure a corresponding improvement in discipline. In any event, the practice of retaining at the depots, frequently during their entire enlistment, men who are needed to lighten the mass of the army, should be discontinued if the army is ever to receive the full benefit of the system under which the depots are continued. But regimental *esprit de corps* cannot be instilled into the recruits too soon.

The carrying out of this recommendation of the Inspector-General would take our recruits out of the control of the regimental commander—control to which the recruit should be subject from the start.

We would advocate, so far as the First Cavalry recruiting service is concerned, the stationing of one of the troops of the regiment at Des Moines, Iowa, or the establishment and maintenance there of a regimental recruiting depot. Our present method of forwarding recruits direct to the regiment (in Arizona) from the place of enlistment (in Iowa) is open to the serious objection that it will not stand the test of war. It would not do to forward a depleted regiment of cavalry in the field or on campaign these country boys without training or preparation or equipment. Moreover, the permanent success of the First Cavalry recruiting service is dependent on the popularity which the regiment attains in that State; and it is to our interest to develop and foster among the young men of Iowa a fondness for horsemanship, and lead them to organize cavalry as a part of their State Militia. There is not to-day in the Iowa National Guard any cavalry whatever. The stationing in their

capital city of a crack troop of U. S. cavalry would be followed by the development of cavalry organizations in Des Moines and elsewhere in the State.

But membership in a militia cavalry is expensive, and those young men imbued with the cavalry spirit, but who could not afford such membership, would see their way to gratifying their desires by joining the First Regiment of U. S. Cavalry.

It has been the aim of those directing and controlling the First Cavalry recruiting service in Iowa to make the regiment well known and popular in that State; to make known to its people the actual facts regarding service in the cavalry on the frontier; to correct mistaken notions prejudicial to the good name of the regular army; and generally to so firmly entrench and establish the service and regiment in the respect and good-will of the people of that section that service in the First Cavalry will be known and regarded as an honorable calling. This done, the regiment can depend on Iowa to supply the majority of its recruits year by year.

In the event of heavy loss of men, Iowa would respond to the call. It would not be necessary to recruit the toughs of the great cities and hurry them to the front, as was done after the CUSTER massacre. The citizens of Iowa and their Representatives in Congress will watch our treatment of these young men, and their criticism and interest will hasten any needed reforms, and promote advantageous legislation by Congress. Even the bugbear of desertion is likely to hide its diminished head.

I think we are arriving at the conclusion that desertion in the army cannot be prevented, either by harsh measures or by coddling. But territorial recruiting will have an appreciable effect on desertions. A young man having enlisted at his home in Iowa, and having for his associates in the army many young men from that section, cannot desert without the fact becoming known to his friends and acquaintances at home. The heinousness of the crime of desertion, and the lack of justification for such a step, will come to be known and appreciated among the people of that community, and a healthy sentiment against it will prevail.

Much more could be written on the subject of this paper. Recruiting methods are now receiving the consideration which their importance deserves. Official reports show that the average cost of enlisting each recruit has been over \$157.00, sufficient to keep a private in a European army for a whole year; and the depot system keeps too many men away from the colors.

FORT BAYARD, N. M., March 22, 1894.

REGIMENTAL RECRUITING SERVICE.

BY ALBERT L. MILLS, FIRST LIEUTENANT AND ADJUTANT FIRST CAVALRY, U. S. A.

THE matter in this paper is drawn from the practical results obtained by the special regimental recruiting service of the First Cavalry. Those most concerned agree that these results, as far as can now be seen, are most gratifying. They fully reward the painstaking labor of the recruiting officer who initiated the service, and justify the earnest efforts of the regimental commander, and the liberal support accorded to the latter's views and wishes by the War Department.

To begin with it will be well to give a brief account of the inauguration and conduct of the service, and call attention to the guiding principles that have been followed in prosecuting it. In the summer and fall of 1892, the First Cavalry, through various causes, incidental to the service, had become depleted greatly in enlisted strength, and times throughout the country being good the general recruiting service found it difficult to meet the demands of the cavalry service for recruits.

First Lieutenant J. G. GALBRAITH, First Cavalry, then on general recruiting duty, stationed at Davenport, Iowa, knowing the condition of his regiment, and believing that the State of Iowa offered a good field for securing desirable cavalry recruits by regimental recruiting, presented a plan to the regimental commander, who, approving, forwarded it to the War Department, which gave its approval, and the service was inaugurated in October, 1892, with Lieutenant GALBRAITH as recruiting officer, and the State of Iowa as the field of operations. This extensive field, however, has not been worked. All efforts have been concentrated in a district ninety miles about the city of Des Moines, to which district, as a recruiting field, exclusive jurisdiction was given later to the First Cavalry by the War Department. This district has proved ample.

It is as large as can be thoroughly worked in the manner later described. It has furnished all recruits so far received, and can now be depended on for all that will be required in the future.

Circular No. 7, Adjutant-General's Office, of 1892, sets forth the system of special regimental recruiting, and gives instructions for its prosecution. While it hardly contemplates a regiment in Arizona recruiting for itself in a field as far distant as Iowa, its general plan has been followed, and its instructions have been the basis of operations. In addition to the matter laid down in it, the following principles have formed the ground work of the First Cavalry service: That the work of recruiting was to be so conducted as to endeavor to popularize and localize the service and the regiment in the district assigned it, so as not only to secure the number of recruits then needed, but insure a full supply for the future, and in time give the regiment its pick of the best young men in the section; and that country towns and villages, where young men from childhood are accustomed to being with and caring for horses, were the proper places to seek the desirable cavalry recruit.

As preliminary to work, a recruiting party was organized and sent to report to the recruiting officer in Iowa. The party consisted of two non-commissioned officers and three privates, and has since remained at about that strength. The greatest care was exercised to select only representative men in every way for the party. Particular attention was given to the fit and appearance of their uniform—the only clothing they were allowed to take—and to the neatness of their accoutrements. Endeavor was also made to impress them fully with the importance of the duty they were to perform, and how greatly its successful prosecution would depend upon their conduct and the impression they created. The lodging, meals, and transportation of the recruiting party, and of recruits joining the regiment were provided by the recruiting officer in his capacity as A. A. Q. M., and A. C. S.

Active operations were begun in November, with a recruiting rendezvous at Des Moines for twenty days, which was then moved in succession to other points, with about twenty days' stay at each, until the district had been pretty thoroughly gone over, when the rendezvous returned to Des Moines, moving then about the district as occasion required. A sub-rendezvous, with a non-commissioned officer in charge, was established at villages adjacent to the main rendezvous whenever practicable. In addition to this personal work of the recruiting party, canvassing was also accomplished by advertising in local newspapers—an important item in the begin-

ning, as in addition to the publicity given, it tended to secure the support and approval of the press for the service. By the display of recruiting posters, and by obtaining from postmasters the names of the inhabitants of the section and mailing to them the recruiting hand-bills and circulars supplied by the Adjutant General's office, together with matter printed at regimental headquarters setting forth the attractions and rewards of the cavalry service, with its changed conditions from the popular belief of it.

As recruits were enlisted they were allowed to remain at their homes or at the rendezvous, until detachments of ten to fifteen were completed, when they were forwarded, in their civilian dress, under escort of one of the recruiting party, to regimental headquarters and there distributed to troops. So far as possible recruits have been given their preference in assignment to troops.

The work of the recruiting officer in the beginning was hard, and would have discouraged one less determined than he. He found himself, his party, and work regarded with distrust; but by persistent effort, and by the exemplary conduct of his assistants and the accounts they gave of the service, distrust began to give way to interest in and gradual approval of the work, until now the service finds itself well established and becoming popular. The regiment is at its maximum strength, and Captain ADAMS, First Cavalry, who has recently relieved Lieutenant GALBRAITH, says he will have no difficulty in keeping it filled with desirable men. An amusing example of the popular belief regarding the regular army which pervaded that section of Iowa when the work of this recruiting began is furnished by a postmaster to whom the recruiting officer applied for the names of young men of good standing in the community. The postmaster gave the names of some twenty young men whom he classed as "bummers" and "ne'er do wells," that the town would be glad to be rid of. He urged the recruiting officer to come and enlist those young men, by force if necessary, and take them away. The other young men of the town, however, the postmaster wrote, were too fine to be allowed to go to ruin in the regular army, and were needed at home; he declined to furnish their names. On the other hand, as the work progressed, approving notices of it and the objects sought appeared in the press of the section. One influential newspaper concluded its commendatory and complimentary notice as follows: "Then in time, if this policy is followed out, the First Cavalry will be known as an Iowa regiment, and it falls heir to a record of gallant service that dates far back and very high up the scale, and in the case of Iowa troopers

it will not suffer in any sense. The regular army is a vastly improved organization, and while strict discipline is enforced, it is at the same time calculated to bring out in the man qualities that are of lasting value. The soldier in the regular service who attends to his duty as laid out before him need know no harsh judgment, and, if he will, can make for himself a career that will be a credit to his name. The field is open to lusty young manhood, and after all what place more honorable than in the first line of the Nation's defense? So thought we in the past, so think we to-day."

To date, 218 enlistments have been made; of these ten have since been discharged by sentence of general court martial for desertion; four have been discharged on surgeon's certificate, and eight by favor, purchase, etc. One hundred and ninety-six are now in the service, and these young men, the antecedents and homes of every one of whom are known and on record, are, as a body, a fine lot of young soldiers, fully meeting the expectations of those most earnest for the success of the service. Claim is not made that all these young men are model soldiers, or that there are not undesirable men among them, but the writer does assert his belief that the detachments of recruits his regiment has been receiving from Iowa are superior to those it has had from the General Service since his experience with it. The recruiting officer, in opening the service, in order to make a beginning, felt himself forced to accept some applicants whose standard was not as high as he wished, but, as the service grew in favor, the standard grew with it. If intelligence, respectability at home, and good conduct, count, the class of recruits the First Cavalry is now receiving should make excellent soldiers.

The fact that sixteen desertions have occurred among these soldiers has attracted attention. It has been commented on officially, and unfavorable conclusions drawn as to the good results to be obtained by regimental recruiting. In opposition thereto, the writer believes the circumstances attending these particular desertions have not received due attention, and that the conclusions arrived at have been hasty. The desertions all occurred at this post (none have taken place from troops at other posts), and within a few months after the men concerned joined. They took place at a time when there had been an epidemic of desertions for some months, which was brought about, beyond question, by the unattractiveness of the station and surrounding country, which had been made almost a desert by long drought. Careful inquiry at the time, by the writer, convinced him that the desertions of these recruits were influenced, almost solely, by the grumblings, examples and ideas of older and

different soldiers. All but two of the sixteen have been arrested and punished, and since last July there have been no desertions from among these soldiers. If the service is continued in the First Cavalry, when it reaches the point that is aimed at—it seems close to it now—it will be a safe assertion to make that this service, in connection with the good measures adopted by the War Department in the past few years, will deal a death blow to desertion in the regiment. The true and heinous nature of the crime of desertion is becoming known among the inhabitants of the recruiting district, as well as the utter lack of all just cause or excuse for it. When this becomes widely known, as it will be if the present course is continued, a young man who enlists at his home will join his troop and find friends and acquaintances there. Should he later become dissatisfied with the army, he will surely take one of the honorable means of leaving it rather than do so by deserting, for he will know that the news of the latter will be sent to his home, bringing disgrace and sorrow to his family, and be a bar to his returning to them in the future.

The following from the record of summary trials at this post, speaks regarding the military conduct of these recruits: "For a year they have constituted one-third and more of the strength of the cavalry troops stationed here. Since they have begun to be an important factor in the strength of the post, there have been 245 convictions by summary court. Among this number only thirty-nine of these men appear; twenty-seven of them have been tried once; eleven have been tried twice, and one three times. Except the trials for desertion, but one of them has been brought before a general court-martial. These men have not yet been put to the crucial test as soldiers, but their proficiency in drill, their appearance, and every other indication, point to their giving a good account of themselves when that time comes."

The foregoing is sufficient, it is thought, to support the assertion that the results so far accomplished by this trial of regimental recruiting are very satisfactory. When there are more applicants for enlistment than there are vacancies, as is now the case (the present distress of the country at large but little affects this recruiting district), the service must be held to be a good one. What has been gained should therefore be held to. There should be no backward step, but every effort should be put forth to further improvement and permanency. Consideration of these latter subjects leads at once to the conclusion that they can best be accomplished by establishing in the district a regimental depot, to which all recruits

should go for a period, and there receive their preliminary drill and instruction until in shape as troopers to join their regiment, whether it be in campaign or garrison. It is essential that the depot be a regimental one, for regimental *esprit* cannot be instituted too soon in the recruit, and it can only be done by the regiment itself. The depot could be formed by a single troop of cavalry; better by two; or if such could not be spared, our skeleton troops could readily be utilized. Such a depot would be an object lesson to the people of the recruiting district. It would relieve troops of the necessity of setting up their recruits, now often a burden on account of the many other duties going on, and in time of war it becomes an absolute necessity, as then it would be suicidal to forward raw recruits to a cavalry regiment actually in the field.

For a long time methods of recruiting have engaged the attention of the army, and much matter has been written and published on the subject. The practical results of the First Cavalry's attempt at regimental recruiting, on the lines above mentioned, are worthy of general attention. They are open to all regiments following a similar course. The system entails new responsibilities and cares upon regimental officers, who, under it, will no longer command men without influence. It tends to bring the army in touch with the people of the country, which can be productive only of good to the army. The only criticism on the system the writer can find lies in the slight possibility that such an army in the event of sectional troubles arising, might not be loyal to the general government if the latter had to act against their own section.

FORT GRANT, ARIZONA, April 27, 1894.

SOME PERSONAL EXPERIENCE WITH THE WINT SADDLE.

BY CAPTAIN J. H. DORST, FOURTH CAVALRY, U. S. ARMY.

THE object of this paper is to call attention to an invention of one of our cavalry officers, Major T. J. WINT, Tenth Cavalry, that is worthy of more consideration than it has yet received. The Wint adjustable cavalry saddle is practically a McClellan saddle divided into halves by a vertical cut through the middle of the pommel and cantle, made in the direction of the length of the saddle. The halves are held together by iron arches of equal curvature, two of which are fastened in front of the pommel, near its top, and two in rear of the cantle, the arches being perpendicular to the longitudinal axis of the saddle. On examining these pairs of arches, say, for instance, the two arches at the pommel, we find that one arch has one of its ends firmly attached to the right side of the saddle, and that the other arch is fastened in the same way to the left side. The free end of each arch projects in front of the other side of the saddle, consequently the projecting portions of each pair overlap. They are so made that one slides along a slot in the other, the distance through which they are allowed to move freely being limited to about two inches. The arches in that of the cantle are adjustable in exactly the same way. Anywhere within the limit of play the arches can be firmly clamped by means of thumb screws, upon which the saddle becomes perfectly rigid. These screws are so attached that they cannot drop off and get lost.

When the arches are pulled apart, the two sides of the saddle naturally move away from each other at the pommel and cantle. They must of course follow the curvature of the arches, which is such that the outer edges of the bars move downward and inward, that is, toward each other, thus making the angle formed by the bars more acute. On the contrary, when the arches are pushed together, the two sides approach each other at the top of the pom-

mel and cantle, while the outer edges of the bars move upward and outward, making the angle formed by the bars more open. The curve of the arches is such that the width of the longitudinal opening along the seat of the saddle is but slightly affected, if at all, by any change in the position of the sides. When the arches are clamped at about half way between the limits of their permitted play, the under surface of the saddle corresponds very nearly to that of the McClellan. The saddle can be used with the thumb screws loose, in which case it will adjust itself under the rider.

The advantages claimed for this saddle by its inventor are, in substance, that it can be adjusted to the back of any cavalry horse in good condition so as to fit him at least as well as any other saddle, and that it can be adjusted to suit the changing condition of a horse during a campaign so as to fit him much better than any rigid saddle can, thereby making it easier for him to carry his load, and also reducing the chances of his getting a sore back. The claim is not made that it can be made to fit any horse perfectly—a condition only possible with flexible or spring-padded bars—but that it can be made to fit any horse better, as his condition changes during a campaign, and have a larger bearing surface than any rigid saddle. There can be no doubt that the inventor's claims are perfectly justifiable; the only question is whether such a saddle can be constructed that will satisfy other service conditions as well or better than our service saddle, or whether its defects in that respect are more than compensated by its advantages.

A cavalry saddle, in order to be as good as our service saddle, should not warp or spread in several campaigns under all conditions of weather, nor break or bend when the saddled horse rolls on it, or when he falls or is thrown on it. It should be so made that the lot of baggage the soldier is required to carry can be conveniently fastened to it with the weight equably distributed. Generally speaking, any saddle should have as large a bearing surface as possible, and be as light as it can be made and still fulfill the other conditions.

If my memory is right, Major WINT's cavalry saddle is one or two ounces heavier than the McClellan. The manner of attaching the carbine boot and saddle-bags would have to be somewhat modified to suit it, but that is a matter which offers no serious difficulty. Some opinion as to the other points may be formed from a relation of my experience with the saddle.

I was furnished one of these saddles in the autumn of 1886, while serving in Arizona. It was used constantly on all duty about the post, and to some little extent in the field, but without establishing

whether it was better or worse than the McClellan. On being ordered to duty at West Point, in the latter part of August, 1887, I took it with me and used it there. At the end of about two months one of the pommel arches broke. I think the break was caused by the almost daily practice of jumping hurdles. At the time it occurred I was riding a horse named "McKinney," that is well known to many of our younger officers. At that time he was an old and heavy but powerful horse, with a broad and deep sway back, and high but rather thick withers. He had an oblique and well muscled shoulder, and habitually carried his head high, which threw his shoulder-blades back against the points of the saddle. It was impossible to make any saddle fit such a back well. On landing at the end of a jump, the saddle was probably forced forward slightly, and the shoulder-blades came back far enough to exert a pressure under it to spread it outward. The frequent repetition of this occurrence was, I think, the cause of the breaking of the arch. I had it repaired, but in a few months the same arch broke in another place, under similar circumstances. I then got new arches from Major Wint, which lasted about a year, when one broke again. The cantle arches never gave any trouble.

Finally, in the summer of 1889, I was furnished a new saddle with arches of what was said to be better material. I used this saddle constantly at West Point until I left there a year later, and have continued to use it ever since. While traveling on a mountain road, in the summer of 1891, one of the quarter straps (spiders) broke, and I had to use another saddle for several weeks, being in the field, until an opportunity offered for having it repaired. Of course, the model of the saddle had nothing to do with this accident, which might have occurred with the McClellan. This is the only accident that has happened to it, and since I have received it I have used no other saddle except while I was there waiting to have it repaired.

In our service, cavalry field duty of an active nature has invariably been accompanied by cutting down, or more frequently by stopping entirely, the allowance of forage, the horses depending on grass for sustenance. The consequence is that they soon commence to lose flesh. In the summer of 1891 and again in 1892 my troop was in the field in the Sequoia National Park in California, working under the usual conditions. Two camps were established where forage was kept. The patrols depended on the few sacks of grain that could be carried on an insufficient number of pack mules, and on grass, frequently having the latter alone. The land included in

this park was almost unknown. One road went through it at its narrowest part, and an abandoned road led into it at another place for about eight miles. There were also two or three cattle trails running through it from east to west, and these roads and trails were the only ones that existed. In an air line this park is only twenty-four miles from north to south, and from six to twelve miles from east to west. The country is mountainous, the altitudes above sea level varying from about 1,500 to 13,000 feet. It contains four principal valleys or cañons from 1,500 to more than 5,000 feet deep. The troop had to keep hunters, cattle and sheep out of this tract of land, and also out of General Grant Park, the latter being much smaller and some ten or twelve miles distant from the former by trail. On the same day we have found ice in our camp kettles in the morning, and have gone down hill to a temperature of 110 degrees in the shade by two o'clock in the afternoon. The coldest weather ever felt, in the early summer and late fall, was probably about fifteen degrees below freezing. We had extremely dry weather, and also rain and snow. These conditions of weather were variable enough to test any saddle pretty thoroughly, as were also the other conditions of the service. At the main camp, where we had tents, the saddle was always kept on a rack outside, in the open air. In the summer of 1891 I traveled about 1,500 miles with this saddle in the Sequoia and General Grant parks and vicinity, and in the summer of 1892 about 2,000.

In the summer of 1893 my troop marched from the Presidio of San Francisco to the Yosemite Valley and back in thirty days, a distance of about 600 miles. On this trip we were fortunate enough to have full forage. On the hottest day we experienced a temperature of 110 degrees in the shade and marched thirty-six miles. In the Yosemite Park we had frost and ice. It will be seen from this statement that in addition to garrison use the saddle has been used in traveling at least 4,000 miles in the field, under widely varying conditions. I have now had it five years (August, 1894), and it still seems to be as good as new.

Some may wish to know how it has fulfilled expectations in regard to its adjustment to suit the shape of a horse's back. In this connection it may be noted that one always assumes that an officer rides a horse whose back is naturally well shaped and not likely to be hurt by an ordinary saddle, and that his experience will be confined to only a few such horses. I will speak of field service only, for our garrison riding is not of a kind to furnish ground for a trustworthy opinion. In May, 1891, when my troop went to the

Sequoia Park the first time, I rode for a few weeks an old troop horse with a straight and somewhat sharp back without injuring him. He was subsequently given a sore back by a man who rode him with a McClellan saddle. While I was riding him I had under training a small four-year-old, that had just been bought, half bronco by breeding and full bronco by nature. On giving up the other horse I commenced using him. He was simply a nicely formed, chunky, round-bodied animal that had never been ridden, and whose back was soft. After I had ridden him sometime a small sore appeared five or six inches in front of where the back end of the saddle rested. The saddle was adjusted to give it relief and it got well, but it reappeared when the saddle was again adjusted to fit the back. The rehealing and recurrence of the sore was repeated several times, and then, on carefully examining the bearing surface of the saddle, a small prominence was found that pressed just over the sore spot. This was trimmed off and the trouble ceased. The horse being young and unused to hard work, especially in high altitudes, he readily grew thin, but he was never kept at work until he was very much reduced. To give him a rest, I rode other horses occasionally, with all kinds of backs, but none were made sore. One that I used in October for a trip of about 200 miles was a new unassigned horse, with high withers and a broad, hollow back. Early in the following summer, after he had become used to the saddle, his rider gave him a sore back with a McClellan saddle.

In May, 1892, we started on a march from the Presidio to the Sequoia Park for another tour of duty, the distance being a little less than 300 miles. On this occasion I had a horse of my own, a tall four-year-old, with a short neck, heavy head, straight shoulder, rather narrow chest, somewhat upright front pasterns, low but rather sharp withers, a strong, straight back that ascended from the withers to a high croup, good quarters and very good hind legs. He was not an ideal officer's horse, but the department inspector was coming around and I had to have a mount. I was not required to have such a horse as a cavalry officer ought to have, and at that time it was almost impossible to get one in California. The horses of the country were either broncos, coarse draft, trotters, or a miscellaneous mixture of these, or race horses. Only among the latter could one expect to find an animal fit for an officer to ride, but none that were not broken down could be bought except by men of wealth. In changing station from West Point to San Francisco the expense of shipping a good officer's horse was too great for the government to bear, and as at moving time one has need of all his

money, the expense was also too great for me. This new horse was quite sick when we started, but one of the men became incapacitated for riding and I took his. His horse had a well shaped back but it had been sore the summer before, and was tender now. One or two spots on his back were hairless and very sensitive. The journey to the park was made in fifteen days and the back was not injured. The longest march was about thirty-five miles, made on the hottest day of the trip.

On this march I bought another horse, a five-year-old, that was well broken to harness, but had never had a saddle on his back. He was a mixture of trotting and blood stock, and good looking all around. He had splendid shoulders and high withers. Just back of the withers his back was hollow; then it took a bend in the contrary direction, and was slightly roached towards the croup, which was about as high as the withers. He was about fifteen and one-half hands high, strong and muscular, deep-chested, well ribbed, and inclined at that time to be a little bony.

After arriving at the park I rode still another horse, which I do not now remember, while the four-year-old was recovering his strength and the five-year-old was being broken to the saddle. About the middle of June I commenced riding the four-year-old, as he was then in good flesh and strong. By the 12th of July, however, hard work and little grain had made him very tired and thin. He went thirty-two miles that day, but I had to drop him at one of our small camps, where I took a soldier's horse for travel to the main camp, reaching the latter at daylight next morning. There I took the five-year-old for his first trip, riding him twenty-six miles that day, going 7,000 feet down hill. The next day he went thirty-two miles and 6,000 feet up hill. He rested the next day, but for the next twelve days he traveled from twelve to twenty-five miles a day, between altitudes of 6,000 and 11,000 feet above sea level. He then retraced his steps of the first day, going twenty-six miles and 7,000 feet up hill. He had become a mere bag of bones, and for the last three miles he had to be whipped, riderless, into camp. This was too hard work for a green horse, and he was not used again except for exercise and to keep him from forgetting his training, for about three months, when he acquitted himself very well. But the interesting part is that this horse's back, which was quite soft and not used to supporting a heavy weight, and which had changed its shape very greatly in the space of two weeks, was not injured in the least. On one side of his withers was a callous lump about as big as half a walnut, made by the pressure of the harness-pad. All the time

the shape of his back was changing, the saddle was kept so adjusted as not to irritate it.

On getting into camp I found the four-year-old slightly lame, which made it necessary for me to borrow a man's horse again. The animal I got this time was a cart horse by birth and conformation.* He was only a little over fifteen hands high, but he was conspicuously the broadest horse in the troop and the heaviest. He had sore withers and a very bad sore under the rear end of one of the saddle bars. He was the only horse available, and I must confess I took him for a fifteen-mile trip with some misgivings. The trail we had to travel was quite rough. In the first three miles we ascended over 3,000 feet, to a saddle 11,400 feet high; in the next five miles we descended 4,000 feet; in the next four we ascended 3,000 feet and descended 1,500; for the last three miles the ground was fairly level, but the trail was through woods with quantities of fallen timber, that the horse had to climb over or jump. On going into camp his back was found to be absolutely uninjured. This, however, I believe was to a great extent a matter of pure good luck. He is the only horse that has spread the saddle to its extreme limit. The McClellan saddle was too small for him; it rested too nearly on its edges and gave too small a bearing surface for the weight. His back never became thoroughly sound again.

A few days after this I gave the four-year-old a sore back. He was still quite thin, and while we were driving cattle down a descent of 5,000 feet in a distance of two miles and-a-half, the saddle worked over his withers, because the hair girth was too long to let it be fastened in place securely. Of course we were on foot, and the pressure of the saddle alone would probably not have hurt him, but it was loaded with bedding, clothing and rations, which brought considerable weight on his withers. The skin on them was abraded, but by putting several blankets under the saddle to compensate for his thinness of body and to let the saddle be cinched tightly, and by adjusting the saddle so that there would be no pressure on the sore place, the withers got well while the horse was being used.

It is not necessary to mention more details to show that the saddle was tested in a variety of ways on a variety of horses. In

*NOTE.—Some of our people are greatly interested in uniform methods, equipments, etc., and often write to the army papers calling attention to want of uniformity in various matters. Some of these "gentlemen who see buttons," to quote the language of a poor foreign military ignoramus, who has not yet learned the lessons of our war, want the troops serving in the hot and dry Rio Grande valley, in the rains of Oregon and in the blizzards of Dakota, to be obliged to use the same kind of tents, for the sake of uniformity. While they are worrying about these matters, can they not possibly devise some way under the sun by which we can get uniform horses?

the mountain work a great deal of the traveling was on foot, the horses being led. Other facts about the marching should be known, however, to assist one in forming a proper opinion about the saddle's value. Some will say that the methods observed were such that there would have been very little excuse for my giving a horse a sore back with any saddle. Others will perhaps say that every common sense rule was violated, and that I ought always to give a horse a sore back. The advantages of the saddle should be apparent to the latter.

To determine the best place for the saddle on the horse's back, the saddle was moved backward and forward until a position for it was found that seemed to suit him best. The four-year-old traveled best when the front end of the bars was about four finger breadths from the point of his shoulder blades. His back has already been described as perfectly straight, and rising slightly from withers to croup. I do not know where any particular one of his spinous processes was located, but with the saddle in that place he walked faster, more smoothly and with less fatigue than when it was placed farther forward or to the rear. The saddle was rather far back, but it has been stated that his shoulders were straight, his front pasterns somewhat upright and consequently weak, while his hind parts were strong. He traveled best when the position of the weight was accommodated to his muscular conformation and physical strength, instead of to the position of a certain vertebra. The five-year-old went best with the ends of the saddle resting on the shoulder blades. I did not dare to leave it there, but moved it about one finger's breadth back from the shoulder blades and then tried to set the bars at such an angle that the shoulder blades could work backward under them without getting bruised, which effort was successful.

In traveling on good roads the girths were loosened at least twice on an ordinary march, the blanket and saddle lifted for a few seconds entirely clear of the horse's back and the position of the saddle slightly changed, either forward or back, if only for a quarter of an inch, in order not to keep a steady pressure all day in exactly the same place on the back. This will also help materially to prevent girth sores on the horse's sides. In mountain work this shifting of the saddle was more frequent and more necessary, because the saddle had to be girthed more tightly to keep it from slipping along the back. Before commencing a long ascent the saddle was always placed well forward, with much of the load on the pommel; before descending a long hill it was always put well back, with most of the load on the cantle. Care was always taken to have the stirrups

of equal length, to have the weights on the saddle equally divided between the two sides, and to use the reins as much with one hand as the other, in order not to get into the habit of riding with one shoulder advanced and the body twisted. Sometimes two blankets were used under the saddle, as the increased thickness of cloth forms a pad which keeps the points of the saddle from boring into the horse's back in going up and down steep mountain slopes—and sometimes but one was used. Mountain traveling, especially where there are no roads and only a few bad trails, is very slow and tiresome work, and when the time required for a journey was more than eight hours, a halt of an hour or so was made about noon, if a suitable place could be found, and the horses unsaddled. On the hottest days, as soon as the camping place was reached, the horses were promptly unsaddled and the blankets taken off to let the sun "scald" their backs, if it could, by the cooling process of evaporating the sweat. In cool weather, however, if the horses were hot, the blanket was kept on for some time. One thing could not be prevented, and that was the unequal stretching of the quarter straps, especially in damp or rainy weather. The two straps of each pair sometimes differ in length as much as an inch, from unequal stretching, and this will perhaps account for more sore backs than we imagine.

It was found that on level or ordinary rolling ground the saddle would usually keep its place very well without clamping the arches with the thumbscrews. But in hilly country and in high jumping the saddle will move unless it is made rigid. On most horses it will move forward more readily than backward, and open out so as to slide over the shoulder-blades. For this reason any adjustable saddle that cannot be made rigid cannot be so good as that of Major Wint. The difficulty may perhaps be obviated in some degree by girthing the saddle very tightly, but that in itself is objectionable. A similar difficulty will probably be found with any girthing device that allows the saddle to adjust itself.

No horse has ever fallen over backwards in hard ground with my saddle. The half-breed bronco fell backward with it in sand, and several have rolled with it in soft ground. The projecting edges of the thumbscrews wore holes in a coat that was strapped to it for several weeks.

I am not sure that my saddle is not lighter than the one intended for the men. It is narrow in front, like the Whitman, which allows one to grip the horse with the knees. The McClellan is so wide here that the forked seat and long stirrups used by most men are forced

on them by the shape of the saddle. If they raise their knees to get a fair grip, as most of them must do, their legs clasp the saddle instead of the horse. My saddle has also a low, wide pommel, which is not so dangerous as a high peaked one, and allows the hands to be held lower. I used it over three years without oiling the arches. They became rusty and worked hard, but I found no difficulty in opening or closing them by striking the saddle with a piece of wood. It was finally considered best to oil them, because the climate of the Presidio of San Francisco is very damp.

In conclusion, I can say that for my personal use in the field I prefer the Wint saddle to any that I know. I should try to round off those thumbscrews to prevent their chafing articles attached to the saddle. I should leave the front as narrow as it now is, and take off about an inch from the front end of the bars and add that much to their other extremity without moving the seat back. On horses whose withers extend well back—as is the case with those that have the long, oblique shoulder-blades that all our cavalry horses should have—and on those that are strong in front and weak behind, the saddle could then be brought forward to its proper place without interfering with the action of the shoulder-blades. Besides, the addition of an inch or so to the bars behind the cantle will give a larger bearing surface for the greater portion of the weight. There seems to be an opinion that the center of gravity of the load the horse carries is over the middle of the seat of the saddle, but, as our men sit and as our saddles are packed the center of gravity of the load is considerably in rear of that point. If the saddle is put in a certain place on the horse, because the center of gravity of the load is supposed to be over the middle of its seat, the saddle will be too far to the rear, and the center of gravity of the load can only be brought over the proper spot on the horse's back by moving the saddle farther to the front. The sores at the withers are almost invariably caused by pinching, not by pressure, notwithstanding the very small area of the bearing surface of the saddle there, and no matter how carelessly the rider sits. On the contrary, the sores that appear under the cantle, where the bearing surface is much greater, are due almost invariably to pressure. This, alone, goes to show where the most weight is situated.

There is also an inclination to saddle all our horses with reference to a certain part of the backbone, neglecting the fact that the proper position of the saddle depends on various causes, among them the horse's age, condition, training, shape and the proportional development of his muscles. A young, untrained and half-broken horse

carries a load most easily when it is close up to his withers; as his back and hind legs grow stronger, and his body develops, he learns to move with comparative ease with the weight farther back, etc.

But this is not intended to be an essay on saddling in general. The last remarks are merely to show that for our use a certain saddle might profitably be made shorter in front of the pommel and longer behind the cantle.

OFFICERS' PATROLS.

BY FIRST LIEUTENANT W. H. SMITH, ADJUTANT TENTH CAVALRY, U. S. ARMY.

OFFICERS' patrols, as a means of gaining information of the enemy, have never been extensively used in any of our wars, so far as I can learn from the reading of history. When used at all they seem to have been restricted to the ordinary scouting or patrolling in connection with the outpost chain, and in carrying dispatches between different portions of the army. When it was desired to gain information of the strength and dispositions of the enemy while yet at a distance, specially employed scouts or spies seem to have been used.

The reasons for the lack of employment of officers on this important duty of gaining information of the enemy by actual scouting and reconnoitering in his own territory, appear to be due to the fact that all our wars have been fought with volunteer armies, only the subaltern officers of which it is practicable to employ on this kind of duty, and they have rarely had any previous military training or education. And it is needless to demonstrate, I think, that some previous training is necessary to enable an observer to estimate with any reasonable accuracy the strength and composition of a force by viewing its marching columns through his field-glass, or noting the forms and extent of its camps or bivouacs. Hence from a lack of trained officers it seems to have been necessary for our general officers to depend very largely on the reports of spies for their information. But it takes time to form a corps of intelligent and well trained spies, as well as to find out those that can be depended upon. McCLELLAN, at the beginning of our Civil War, had numerous spies in Richmond, yet he invariably estimated the Confederate forces at double their actual number, while later on in the same war SHERIDAN with a small, but well tried and practiced body of the same kind of men, kept very accurately informed of everything concerning the enemy.

It is a common saying that in war no means should be neglected of gaining information of the enemy. Officers' patrols, spies, newspapers, captured letters, telegrams, prisoners, etc., are a few of the numerous sources from which the staff of an army gains information concerning the enemy. But of all these I think that officers' patrols, when sufficiently numerous and properly conducted, are the most prolific as well as reliable source of information. I also believe that the officers of a volunteer regiment, if properly instructed by means of lectures and practical problems, can, in addition to learning their numerous other duties, soon become sufficiently expert to begin the performance of this duty, in which practice will rapidly improve them. Hence I think that a study of this subject is not only very important to each of us as something we ought to know individually, but should any of us be fortunate enough to get command of a volunteer cavalry regiment on the outbreak of a war, it would be very much more important as a means of enabling us to make our regiment rapidly efficient in one of the most essential duties of cavalry. It is a kind of service which appeals very strongly to all young officers animated with the true cavalry spirit and love of adventure, and at the same time offers the best and readiest means for a youngster to distinguish himself, as witness STUART's ride around McCLELLAN's army during the Peninsular Campaign. This same ride could probably have been as easily made by an officer and twenty men as with all the cavalry STUART took with him, and the material results would probably have been about the same; that is, the telegraph lines and railroad could have been cut, thus interrupting communication. An equal amount of supplies could have been destroyed, and probably about the same moral effect produced. Of course the Federal cavalry would have had to be avoided, but this would not have been a difficult matter at the time. So that if the enthusiasm of the young volunteer cavalry officers be directed into the proper channel and they be properly instructed, it is believed that good results would be obtained.

With this as a preface I shall attempt to point out the results to be obtained by officers' patrols, some of the different ways of conducting them, and the general considerations which should govern an officer when on this duty.

I take it for granted that when an army takes up its march towards the enemy that it will be preceded by its cavalry. This cavalry will be preceded by its advance guards and these advance guards will be preceded by contact squadrons or troops, officers' patrols and scouts or spies, and that all information concerning the

enemy will be transmitted as a rule to the army commander through the cavalry commander. This being the case, from what part of the cavalry force should the officers for patrol duty be selected, and from whom should they receive their orders? From the vanguard, the support or the reserve, and should they receive their instructions from the division, advance guard or vanguard commander? It seems evident that an officer sent out on duty which may detach him for from one to several days from supporting distance of his command and possibly also from communication with it, should be thoroughly informed of everything then known concerning the enemy, and also of the intentions of his chief. This being the case it would seem that the division commander or his chief of staff would be the only officers whose field of view and knowledge of the situation would be sufficiently extended to give him the necessary instructions, and that the reserve would be the most convenient and available force from which to detach him. Of course other considerations might govern in the selection of particular officers for this duty, such as the character of the officer himself, his knowledge of the country, the condition of his mount and, in case of foreign war, his knowledge of the enemy's language, but in the general case I think, as before said, it would be better to select officers for this duty from the reserve.

The following are some quotations from the German Field Regulations concerning this phase of the subject: "A subordinate will distinguish the more readily information of value from that without importance, the better he is instructed in the intentions of his chief."
* * * The officer ought as much as possible to be informed of the situation relative to the enemy and of the intentions of his chief."

Another consideration has to be taken into account here, however, by an officer commanding volunteer forces, and that is the possible indiscretions of the young volunteer officer in case of his capture by the enemy. Through ignorance of the harm it might do or through thoughtlessness he might disclose important information to the enemy. However, if he is properly warned beforehand it is believed this would rarely happen.

From the foregoing consideration it would seem decidedly preferable for the division commander to order a certain number of officers to report to him, each accompanied by the necessary number of troopers, and himself give the officers the proper instructions and information relative to the objects he wishes them to accomplish. As an illustration of a faulty method of giving instructions, let us suppose that a cavalry commander is ordered to gain and protect a

certain line of railroad until the arrival of the infantry. In sending out his patrols he neglects to inform the officers of his intentions, but merely tells them that the division will march in a certain direction, and assigns each a section of country to explore and directs them to send back all obtainable information concerning the enemy. One of the officers, in the course of his exploration, observes patrols of the enemy on this railroad, but not knowing the intentions of his chief does not think the information of sufficient value to justify sending a special report, so waits until he collects other information before reporting it, thus allowing the enemy time to damage the road considerably.

From these general considerations it may be well to pass to more definite ones, and among these the first to be considered are the

DIFFERENT MISSIONS OF PATROLS.

When an army starts on its march towards an enemy, the first object is to gain contact with him, that is, find out where his troops are, whether marching or stationary, etc., and, by inference, his objects and intentions. In this case patrols would be sent forward on all the main routes leading to the enemy, with orders to advance until contact was established, and then to send or bring back all obtainable information concerning him.

After the enemy had been located at certain points the second stage of proceedings would commence, and it is this stage that offers by far the most numerous missions for patrols. For instance, the division commander having received information that the enemy had arrived at *A* and *B* he might send out patrols with missions as follows:

Patrol No. 1—What are the enemy's forces at *A*?

Patrol No. 2—What are the enemy's forces at *B*?

Patrol No. 3—Have the enemy yet occupied a lateral point *C*?

A third stage would be when the opposing armies had arrived within one or two days' march of each other, and were concentrating for battle. In this case it would be desirable to partially surround the enemy with a semi-circle of officers' patrols, who, from elevated and distant positions, would watch all the movements of his marching columns.

Other stages that would offer great opportunities to officers' patrols would be during the battle in working around the enemy's flanks and penetrating to his rear, and in hanging on to his flanks and heads of his columns in case of retreat.

Having thus pointed out some of the different missions of an officers' patrol, let us proceed to the methods of

ACCOMPLISHING THE MISSION.

The methods of marching a patrol, the careful inspection of horses and equipments, and the precautions to be taken against surprise and capture, are so thoroughly dealt with in all works on minor tactics that I will proceed to other considerations.

I take it for granted that an officer will use every effort to provide himself with the best obtainable maps of the country and with good field-glasses, but above and beyond everything else, with a good horse, one with speed and bottom and cross country qualifications. One could easily cite instances from MARION to the present time when the possession of a good horse was indeed worth a kingdom. And, in passing, how many people ever think of the immense value to the country in case of war of the cross country clubs, especially those in the Eastern States, not only as furnishing numerous bold and practiced riders as prospective officers of volunteer cavalry, but also in furnishing our horse breeders an incentive for breeding the most useful class of horses for cavalry purposes.

When an officer gets his orders then to go in search of information concerning the enemy, the first consideration will be the selection of his route. Should the selection of the route be left discretionary with the officer himself or be defined for him by the cavalry commander? The weight of European authority seems to be in favor of the former as a rule, but nevertheless there are circumstances which sometimes render the latter preferable. Before contact is established with the enemy, and officers' patrols are sent forward on all the main routes leading to the enemy, there would rarely arise any good reasons for an officer to depart from these routes, for the enemy must advance by some of them, and the officer knowing that the roads to the right and left of him are being patrolled, there would seem no occasion for him to concern himself about any other than the one he is traversing. Again, after contact has been established at certain points, it may be very important to the cavalry commander to know if the enemy is advancing by some other definite route. In this and the preceding case, and in others of a similar nature, it would seem best for the cavalry commander to fix an itinerary for the patrol. In this connection, the itinerary being fixed by the commanding general, would the officer ever be justified in departing from it? It seems probable that certain circumstances might occur to justify his doing so. Then what should he do? Two alternatives are open to him. He could divide his patrol, send one

part on the original route with definite instructions as to what they are to accomplish, while he pursues the new course with the other part. Or, if his patrol is too weak to divide, he should send back a courier with full explanation as to why he is departing from his original instructions, so that the commanding general may send another patrol on the route if he thinks it necessary.

But in the majority of instances it would seem best to give an officer as definite an object as possible to accomplish, and leave him to his own means of accomplishing it. This being the case, the first thing to do is to select his route. What considerations should guide him in doing so? Evidently, other things being equal, the shortest and most direct route would be the best, but other things have to be considered, such as the probability of meeting the enemy's patrols and being delayed by them; the local features of the country, such as elevated points for observation, etc.; and last, but not the least, the selection of such a route as will permit of sending back couriers with a fair prospect of their reaching their own lines in safety.

This seems a good place to consider the size of the escort which should accompany the officer. If he be sent on an expedition where it seems probable that he will have to meet and brush aside the enemy's patrols, or where time is important and resistance anticipated, such as the destruction of a railroad bridge, the capture of an official, either civil or military, of the enemy, the capture of a post-office, etc., it is evident that his escort should be strong, probably from twenty to forty men. On the other hand, if he merely goes on a simple tour of exploration or observation, his escort should be proportioned to the probable number of sets of couriers he would want to send back, that is from six to ten men. Again, if he be sent on a particularly secret and dangerous mission, such as carrying dispatches through the enemy's lines, or where he can only go and render a verbal report on his return, it would seem best that he go alone or at most be accompanied by only one or two well selected men.

The officer having received his mission and selected his route, or having had it selected for him, the next thing for him to consider is the pace at which he shall travel. In this several things will influence his decision, such as the total distance he will probably have to travel, the relative importance of getting his information back quickly, the condition of the roads, etc. One of the most important things for him to consider, however, is that at any time his horses may have to make great exertions in order to enable himself and party to escape from the enemy, and for this reason especially he should husband their strength as much as possible. The country

that the officer will have to travel over in the accomplishment of his mission may be roughly divided into two zones, the safe and the dangerous.

Until after he passes his own outpost lines and gets into the neighborhood of those of the enemy, he can evidently travel faster with safety, because of less frequent stops to examine and reconnoiter the country, than he can in that portion where he is liable to run against the enemy at any turn. As his horses can travel an indefinite distance, averaging six to seven miles an hour, by alternating the walk with the trot, and still be in good wind and condition for a rapid gallop, this would seem a good rate to travel, as a rule, while passing over the comparatively safe portion of the country. When the dangerous zone is reached, then considerations of secrecy must be paramount.

This seems a good place to consider one's conduct towards the enemy's patrols. Should one attack them or avoid them? In the general case the latter seems preferable. For, suppose one attacks them and is successful, the usual result would be to drive them back on their own lines, where they will be constantly reinforced, so that it will be only a matter of a short time before the attacking patrol will itself have to retreat, its presence in the vicinity will have become known, and all chance for reconnoitering will be at an end. There are, however, some situations when it is imperative to attack; for instance, when one comes across a patrol of the enemy about to make some important discovery relative to our own forces and dispositions. This should be prevented at all hazard. Or where it is necessary to capture some prisoners. It is always to be remembered that prisoners are a fruitful source of information—the numbers on their caps indicating their regiments—for army headquarters. After a patrol had accomplished its mission and was returning to its own lines, if it saw an opportunity to attack a patrol of the enemy and capture some prisoners, it should not be neglected. Again, if at any time one comes suddenly across a patrol of the enemy, so that it is necessary to either fight or run, it would usually be best to make a charge on the enemy and trust to the resulting confusion to enable one to make his escape.

This is especially the case at night. Boldness and audacity seem to be even more successful when indulged in by small bodies than by large ones. When two parties are mutually surprised, success usually goes to the one which takes the initiative. But in the general case, patrols, unless specially sent out to capture prisoners, should avoid similar patrols of the enemy, and endeavor by shrewd-

ness and woodcraft to accomplish their mission secretly, for it cannot be too strongly insisted on that officers' patrols are sent out for information and not for security, except in so far as timely information of the enemy's movements furnishes security.

For the same purposes of secrecy an officer would usually avoid all towns and thickly settled places, except in a friendly country, and even then he would exercise great caution in visiting them. If necessary to obtain provisions or forage for the party, they should be taken to some secluded spot before eating them. Of course, in any kind of country, it may be necessary to impress guides and question the inhabitants. This last is an exceedingly fruitful source of information, and presents a fine field for an officer's shrewdness and *savoir faire*, but all information obtained in this way should be verified by personal observation when possible. One of SHERIDAN's scouts reported to him, during the Valley campaign, that from all he could learn he believed that KERSHAW's division had been detached from EARLY's army and ordered back to Richmond. SHERIDAN asked him if he had seen it going back. The scout replied that he had not, but that all the people he had talked to said so. SHERIDAN then told him to go back and see for himself. The scout went back through the enemy's lines, and the next day met KERSHAW's division returning to EARLY's command. It transpired afterwards that KERSHAW had been ordered to Richmond, and that two days later the order was countermanded while the division was en route.

Let us suppose, then, that an officer has succeeded in avoiding similar patrols of the enemy and has arrived, undiscovered, in the neighborhood of the enemy. His next endeavor is to get to some elevated position where he can carefully search with his glass all the roads and lanes and folds of the ground. If his position is a good one, he will probably discover some indications of the enemy. If he cannot find out what he wishes to know from this position he must seek some other which will give him a nearer and better view, and before leaving his first position he should lay out for himself and party a route by which he may reach the next position without being discovered. It is this sort of work that will test an officer's knowledge of woodcraft and ability to take advantage of the features of a country. It is in this phase of warfare that the American Indian stands preëminent. A hundred years from now, after what remains of them has become civilized, and the art of predatory warfare has been lost among the miserable remnant, some of their feats of this kind will read like romances, and it seems to me greatly to be regretted that officers familiar from experience with their methods

of scouting should have failed to make any more attempt than has been made to embody them in some tangible shape.

Cautiously proceeding from position to position, carefully reconnoitering all the country within the range of his glasses, being ready at all times to make a run for it if discovered and chased by the enemy, returning as soon as the enemy ceases to pursue, sending back reports whenever anything of importance is discovered, an officer may remain for a day or for several days in contact with the enemy. Patrols of this nature are aptly likened, by General BONIE, of the French army, to flies that one vainly endeavors to brush away but which return to be as annoying as ever as soon as the effort to brush them away ceases. There are no outpost lines so extensive but what they have an end, and the more extensive they are the more likely they are to have gaps in them, so that if an officer is persevering and possesses an aptitude for the work, it will rarely happen that he cannot either work around a flank or penetrate into some interval of the enemy's outposts or advance guards and gain some information about his main body in rear. Of course, all this is risky work, but nothing in war has yet been accomplished without risk, and, usually, if the risk is well considered and not a mere act of daredevilry, the results are proportional, and most certainly the credit is.

An officer should never lose the hope of extricating himself, no matter how unpropitious the circumstances may appear.

During the Franco-German War Lieutenant von BREHOW, of the Ninth German Hussars, returning from a reconnoitering expedition with seven men of his regiment, found himself riding between two long columns of the enemy's infantry, which was marching on parallel roads. Concealing himself and party, and waiting until he saw an interval of about thirty paces in one of the columns, he rode toward this interval at a walk, hoping the enemy would mistake him for a part of their own cavalry, as it was raining hard and his men had on their overcoats and hoods. In this he was successful, the enemy not discovering their mistake until he was within about fifty paces of them: then clapping spurs to their horses his party dashed through the interval, all but one man, whose horse was killed, escaping.

In the summer of 1880, during the campaign against the VICTORIA band of Apache Indians, General GRIERSON's command of the Tenth Cavalry was camped at Eagle Springs, Texas. Some friendly Indian scouts reported the hostiles at the Alamo, a water hole some fifteen or twenty miles distant over the mountains. Corporal

WEAVER and seven men of the Tenth Cavalry, with a few Indian scouts, were sent to verify the report. The patrol left in the night, and before dawn the next morning succeeded in reaching a deep cañon within a few miles of the Alamo, where they concealed themselves that day, and sent out single scouts to look for the enemy. No enemy was sighted that day, and the next night the march was continued towards the Rio Grande. About dawn of the next morning the hostiles in considerable numbers were discovered. The hostiles discovering the patrol about the same time, they immediately began a hot pursuit, which they kept up nearly all the way back to Eagle Springs. The friendly Indian scouts promptly deserted the patrol, and started to make their own way back to camp. The Corporal took advantage of every good position to dismount his men and open fire on the pursuing Indians, thus checking their pursuit for the time, and making them seek cover, when he would again mount his party and dash forward to another position. The Corporal finally succeeded in reaching camp, but with every horse and several of his men wounded. One man, Private **TOCKES**, was killed. Just as the party was mounting after one of the stands this man's horse was badly wounded, and began to plunge and refused to follow the others. Private **TOCKES** then plunged his spurs into him, saying: "Damn you; if you won't go that way, go this," and headed him for the Indians. The last seen of the gallant fellow alive he was spurring his horse in amongst the Indians, the reins hanging on his horse's neck, and firing his carbine at the yelling and dodging savages. The skeleton of himself and horse, both lying near together, were found about six months later.

During the Sioux campaign of 1876, Lieutenant **SIBLEY**, of the Second Cavalry, was sent out from General **CROOK**'s camp on Goose Creek with twenty men of his regiment and one civilian guide, **FRANK GROUARD**, to scout the country to the north of Tongue River and look for Indian trails. After marching some distance he struck a large Indian trail, and while investigating this he was discovered and pursued by a large body of Indians. He made for the foothills of the mountains, and succeeded before being overtaken in reaching a small grove of timber, where he dismounted his party, tied his horses to the trees, and managed to stand the Indians off until dark. Then his ammunition being exhausted, he left his horses tied to the trees, and succeeded in slipping out with his men, and gained the mountains, over which he made his way back to General **CROOK**'s camp several days later. He was near enough at dawn the next morning to hear the yells of the Indians as they charged the grove where his horses were tied.

In the last two instances mentioned capture alive meant death by torture, and to any one acquainted with the cunning and skill of the Indians in this class of warfare it would be difficult to imagine a more hopeless or disheartening predicament in which to be placed than either of the two cases just cited.

It is of comparatively little value at army headquarters for an officer to report that he has seen the enemy's patrols at such and such places, or that he has observed certain bodies of cavalry. The cavalry may be here to-day and there to-morrow, and its presence may or may not mean anything of importance. What is desired at army headquarters is to know where his bodies of infantry and artillery are; their numbers, dispositions and movements; and this information can be obtained only by either penetrating through or working around his advance guards or outposts.

Suppose an officer succeeds in this and gets a view of the enemy's infantry or artillery, how is he to estimate their strength? There are various methods of doing this laid down in text books, some of the simplest of which are as follows:

When an infantry column is on the march, the number of battalions can usually be counted by counting the number of groups of mounted men along the column, the battalion commander and his adjutant being mounted officers. This applies of course to armies organized like our own. In European armies the number of mounted men would indicate the number of companies. These mounted men can be distinguished from foot men for a long distance through the field glass. Another convenient rule is to observe the length of time the column of infantry takes to march by a given point, such as a tree, a house or a bridge, and multiply the number of minutes by 176.

In estimating artillery in column of route, if too far away to count the guns, observe the time as before and multiply the number of minutes by four.

In estimating cavalry in column of route it is necessary to be near enough to see the formation, whether twos or fours, and the gait at which they are traveling. If in column of twos, and marching at a walk, multiply the number of minutes by sixty; if marching at a trot, by 120. If in column of fours, these numbers would have to be doubled.

These rules are based on our own organizations. If estimating an enemy with a different organization, modification would have to be made accordingly.

When troops are halted in position or in bivouac, any accurate estimation of bodies of any size becomes exceedingly difficult, and it

would usually be best to simply report such and such a position as occupied by the enemy, giving the length of the position as accurately as possible, whether or not preparations for defense seem to be going on, or whether they seem to be preparing for bivouac, etc. An officer should always take advantage of every opportunity to estimate bodies of troops, and afterwards verify his estimates when possible. No matter how important the discoveries an officer may make concerning the enemy, it will be of little value unless the information is transmitted quickly to army headquarters in rear. Generally the most important information will be the longest in reaching the proper authorities because of the advanced position of the patrols making the discoveries, hence the expediting of the transmission of reports to the rear should be one of the constant cares of the officers on patrol duty.

To those officers and men of our regular army who have had much experience in scouting over the nearly trackless plains and mountains of our western frontier, the close observation of country becomes a matter of second nature or instinct, and they almost unconsciously carry with them a mental photograph of the country passed over, so that it is a matter requiring very little effort for them to find their way over it again; but with men whose experience has been confined to the thickly settled portions of the States, with roads everywhere, and sign boards at every cross-roads, and people to direct them at every turn, it is quite another matter. From lack of necessity for it, their observation and remembrance of the features of a country are not cultivated, and they are liable to become confused when endeavoring to find their way back rapidly. Hence, unless an officer is experienced himself, and has experienced men with him, he should halt every mile or so on his way out and take a "back sight," so to speak, and endeavor to impress upon his own mind and that of his men the prominent land-marks from that point of view.

Frequently a feature of the landscape will look very different from one point of view to what it does from another. Also at all forks of the road and cross-roads he should endeavor to impress upon the men the proper one to take in case they have to return by that way again. He should endeavor to keep constantly impressed upon his men the general direction in which they are traveling and the general direction of the march of the columns in rear, so that they may find their way to the proper authorities in case they are forced off the direct road in returning with dispatches. A cultivation of the constant observation of the bearing of the points of the compass

cannot be too strongly insisted upon. If due care is thus taken on the way out and the men properly selected for intelligence and trustworthiness beforehand, there should be little difficulty in couriers reaching their own lines unless captured and stopped by the enemy. Of course couriers should take the same precaution to avoid surprise and capture that the patrol does in marching out. As to the number of men to be sent back with each dispatch the patrol commander must exercise his judgment; usually it would seem best to rarely send less than two.

Whether or not a patrol after accomplishing its mission should return by the same or a different route must depend in each case on circumstances to be determined by the officer at the time. Usually, however, it would seem best to return by a different one, not only because more country would thus be explored, but also to avoid any ambush that might be planned by the enemy, or the inhabitants, in case the latter were hostile.

REPORTS.

Although the officer may have obtained valuable information at great personal danger, and transmitted it quickly to his general, it will be of little value unless the report containing it be intelligible and precise. An officer should remember that reports are coming in from all along the front at all times of the day and night. That they have to be read by the general or his staff, sometimes on the march, sometimes at night by a lantern or other poor light, and at all times when numerous other matters are crowding on his attention. The officer should therefore endeavor to make his reports as short, clear, precise, and well written in the legible sense as possible, to leave nothing unsaid which would add to the information of his chief, but on the other hand to say nothing which would not add to it. Each report should be complete in itself, for the reason that if former reports have been made and referred to in explanation of something in the present one, the former ones may not have reached their destination or may not be accessible at the moment of receiving it. Reports should, however, be numbered, not only as a convenient mode of reference, but that the failure of any to be received may be known. They should give the date, hour and place from which sent, and also the date, hour and place at which the information was obtained in case the report is not sent immediately on obtaining it. It should clearly distinguish between what the officer has seen himself and what has been told to him by others, and all vague or uncertain terms or expressions should be avoided. Facts

only should be reported and deductions left to higher authority. The officer's full name, rank and regiment should be signed at the end.

It would probably be well for each army headquarters to have a number of tablets prepared of convenient size for carrying in the pocket, or saddle-bags containing blanks similar to telegraph blanks, with spaces for the place, date, hour, etc., and distribute them to the cavalry commands for use of officers on this duty. One side of the blank could be used for writing the report and the other for making a rough sketch of the enemy's position. A place to hold an indelible pencil could also be constructed on the tablet. This tablet with a package of envelopes would then be all the extra materials an officer would have to carry.

CONCLUSION.

As stated in the beginning of this article, officers' patrols are only one of the many different means of obtaining information of the enemy, and it has been with the hope of demonstrating some of their uses that this paper has been written.

Our frontier work, especially that of the southwest portion, where, until within a few years back, small commands under junior officers were kept almost constantly at work scouting after isolated bands of hostile Indians, was probably the best practice, short of actual war on a large scale, that a young officer could have. Unfortunately for the experience of the younger portion of our officers, the necessity for this kind of work is now practically ended. Can not some method be inaugurated by which the beneficial effects of this service may be continued? General MILES, during the autumns of 1887 and 1888, instituted in the Department of Arizona a system of raids or scouts by small commands which, for beneficial effects on the younger officers taking part in them could hardly be overestimated. In these raids the officers became used to the responsibility of caring for their men and horses in all kinds of weather and country, and of making long and rapid marches under conditions very nearly simulating those of actual war. It is true that occasionally some horses were used up due to the inexperience or want of care of some youngster, but it is believed that this could have been largely, if not entirely, remedied by having the condition of the horses enter as a factor in judging of the success of the raid. The study of the theory of the various operations of war, that is, getting the benefit of the experience of others, is all very well in its way, and of course indispensable to the training of the professional sol-

dier, but unless the application of these theories goes hand in hand with the study of them, much of the possible benefit is lost. Actual experience is a much better preparation, and renders it possible for one to be either a better instructor or actor than the study of books, though the best results are probably obtained by both combined.

NOTE.—In this article but little claim is made for originality. In writing it I have drawn from memory on a good many different authors, such as SHAW, CLERY, WAGNER and VON ROSENBERG. The author on whom I have drawn more than any of the others, however, and whose pamphlet on "Officers' Patrols" I have read many times, is Captain VON KLEIST, of the German Cavalry.

THE PRINCIPLES AND PRACTICES OF SADDLING.*

BY M. J. TREACY, VETERINARIAN, EIGHTH CAVALRY, U. S. ARMY.

THERE should be no more important subject to the cavalryman than that branch of Zootechnics, known as "Saddling." When we seriously consider the dreadful consequences entailed through cavalry on active service being dismounted, owing to their horses being sick—consequences which are not to be lightly passed over or sneered at, but on which may hang the fate of a nation, or the lives of many human beings, we may be pardoned for enquiring how one fruitful source of them is occasioned, and the means by which this evil can be remedied and prevented. Let us imagine for a moment a brigade of cavalry, "the eyes and ears of the army," lying idle on their pickets on account of "sore backs!" Colonel BEAMISH, in his work, "Cavalry in War," says: "Cavalry dismounted are no longer formidable. NAPOLEON, in Moscow, had 10,000 dismounted cavalrymen. They were formed into companies, battalions and regiments, armed and equipped as infantry. But, after the first three days' retreat from "the Kremlin," this fine organization was entirely destroyed, falling into the hands of the Cossacks, or being killed by the natives."

I have no hesitation whatever in stating that the cause of sore backs is due to ignorance, which ignorance begets carelessness. Ignorance, inasmuch as it is impossible for anyone who has not received instruction on this subject to properly fit a saddle to a horse's back. Carelessness, in as far as it is difficult to make people believe that sore backs are due to defective saddling, and that wounds arising from this source, no matter how slight, will never get well until the cause of the irritation is removed. Ignorance, in not regarding the horse's back as being composed of living, sensitive structures; carelessness, in subjecting it, often for hours together,

to the continuous pressure of an unyielding saddle and the weight of a tired soldier. Horses on the march should have their backs, blankets and saddlery looked after each day, if they are to be kept in serviceable condition. How many are there in our cavalry service who are well informed on this subject?

Before entering into a consideration of the fitting of the saddle, we must thoroughly understand the parts of this necessary equipment, as well as the structure upon which it rests. I, therefore, shall attempt to give you a brief outline of the anatomical formation of the horse's back, for until this is clearly comprehended, the work of "fitting" must be entirely empirical and haphazard.

The back has for its foundation a chain of bones known as the dorsal vertebræ, each bone being connected with two ribs, one on each side, eighteen in number. Growing from the upper part are prominent bony processes known as the superior spines. These spines are of the greatest practical importance to us. They are of different lengths, for we notice that they increase greatly in height from the first to the fifth, those forming "the summit of the withers;" from the fifth to the thirteenth they rapidly decrease in size; from the thirteenth to the eighteenth, they are almost uniform. We likewise notice they do not all assume the same direction, for from the first to the fifteenth they incline backward, the sixteenth is upright, the seventeenth and eighteenth incline forward; the fifteenth or sixteenth are said to be the keystone, or center of motion. The ribs are eighteen in number, divided into eight true and ten false; the eight true ribs articulate with, or lean directly on, the sternum or breastbone, the ten false having an indirect attachment with the preceding rib. The case formed by the backbone, breastbone and ribs, for the protection and accommodation of the heart and lungs, is very narrow in front, and increases in width as we proceed backwards. The anterior ribs are consequently straight, whilst the posterior are greatly arched. The ribs which concern us most just now, from the eighth to the eighteenth, present, at their upper surfaces, a flat part of variable width, called the "arch;" for instance, the eighth and ninth have a flat upper surface of about two inches, the tenth to the fourteenth about four inches, the fifteenth to the eighteenth, five inches; as soon as these level places are formed, the ribs curve downwards, to form the sides of the chest. On the width of those level surfaces depends the width of the back, and on those should rest indirectly the sideboards of the saddle. But if we depended on the flat upper surface of the eighth or ninth rib (the eighth is about two inches from the posterior edge of the scapula)

* A lecture delivered before the Fort Meade Lyceum.

to afford a sufficient bearing for the front of the saddle, it would not be enough, for as I have just shown, this surface is but two inches wide. Here we take advantage of those ribs, being strong and firmly fixed to the sternum or breastbone below, to impose weight upon their sides as well as arches, for not only the sides, but the upper surfaces of the ribs, participate in this weight-bearing function, which, from their strength and support below, they are well calculated to exercise.

Here is a saddle, composed of two bridges and two lateral supports; the anterior bridge, or arch, is known as the pommel, the posterior as the cantle; the lateral supports are called the sideboards, right and left: these should end at the pommel, for reasons which I shall explain. The obliquity of the sideboards at the front of the saddle is about 45° ; here are the quarter straps, front and rear, the quarter strap rings, the cinch straps: here the sideboards should follow the exact slope of the ribs: here they should rest flat on the upper surface of the posterior ribs, for their sides, receiving no support from below (unlike the front ribs), cannot bear any weight except on their upper surfaces; they are also shorter and weaker.

In the front ribs the weight is transmitted from above, and also the sides; in the false, from above only. Viewed superiorly, the back is narrow in front, broad behind, shaped somewhat triangularly.

The transverse measurement of the body through the eighth rib is about seven inches; through the eighteenth, sixteen inches. The scapula, or shoulderbone, is flat and triangular, apex inferior, and placed opposite first rib; its posterior upper surface coming as far back as the seventh rib, it is placed against the body in that peculiar direction, obliquing downwards and forwards, particularly in the well bred horse.

The body is slung betwixt the fore limbs: at every movement the angle between the shoulder and arm opens and closes, and the changes of its upper part follows: First, as the limb is extended forward, the anterior angle of the scapula is raised upward and backward, the posterior depressed forward and downward. Second, the knee being fixed, and the foot being planted on the ground, the whole body passes over the limb, which from inclining downwards and forwards when the foot first strikes the ground, gradually assumes the erect position. During the time the posterior angle of the scapula is ascending, and after the body has passed its center of gravity, and the limb assumes the position of downwards and backwards, the ascent of its posterior angle continues until the final propulsion is given to the body, when the whole of the back por-

tion of this bone turns outwards, it, as it were, being pulled at this part from the ribs. This is the last act of propulsion.

I trust I have said sufficient to show: First, that locomotion requires a great variety of movement of the shoulder bone, as it almost describes a semi-circle each time the body passes over the forelimb, the center of motion of this part being the shoulder. Second, that any interference with its movements must affect propulsion, owing to the angles formed by the bones being unable to open and close to the necessary degree: that it must affect materially the safety of the horse and its rider, to say nothing of the pain caused by the pressure of a saddle tightly girthed, with the weight of the rider as well, not forgetting the great waste of muscular force required to overcome those obstructions.

What more ridiculous and pitiable sight can be witnessed, than a troop horse with the saddle on its neck, tightly girthed over his heart and lungs? Human athletes follow the biblical teaching of "girding their loins" during their exertions, leaving the chest free and unconfined for their powerful respiratory efforts. Do we not endeavor to constrict these necessary movements when we cinch forward?

Can we wonder at horses getting tired, with heavy-weights up, when they have an unyielding machine strapped on their shoulder-blades, binding them down each side in a vise, preventing the free movement of the forelimb? Can we wonder, whilst horses are thus maltreated, at stiffened limbs, incurable lameness, and injuries to men? and that on the march, daily reports of "He can't keep up with the command," except by a sickly jog trot. Truly, horses' forelimbs are confined in a veritable straight-jacket under those conditions.

If these points are understood, and the front of our saddle be placed two inches from the posterior end of the shoulder-blade, one of the chief secrets of good saddling is mastered, as we know the forelimb to be an active propeller, as well as weight bearer of the body.

When a man sits upright in his saddle, the forelimbs carry $\frac{3}{10}$ of his weight; when he leans forward, $\frac{5}{10}$; when he leans backward, $\frac{2}{10}$.

What does this lesson teach us?

1. To let nothing touch the shoulder-blades.
2. To carry no equipments on the front of the saddle.
3. To make the soldier sit over the fourteenth dorsal vertebra, thereby saving the forelimbs from the unequal share of lameness, weight and concussion which now falls upon them.

From the above facts we are forced to the following conclusions: First, that the shoulder must in nowise be interfered with or pressed upon, or its function is very seriously impaired. It must have free and uncontrolled play. Second, that the shape of the ribs proves where weight can be best supported. The large true rib, with its small upper surface, will stand pressure in a downward and outward direction; the false one, with its large upper surface, can bear weight in a downward direction only. Third, the bony processes growing from the upper surface of the spine, are unfit to bear weight. Fourth, that any part of the back posterior to the ribs cannot bear weight: first, because there is no support below; second, the kidneys are immediately beneath the surface; third, the large propelling muscles of the body expand and contract here, causing a peculiar to and fro motion, which can be plainly felt by the hand being placed on the loins; these will force the saddle forward and cause abrasions.

It is necessary to remember that no two horses' backs are alike, no more than men's feet are, and if our saddles are made according to regulation, horses' backs are not. Some are high in the withers, some low, some short and broad, others long and thin; some with backs like a billiard table, others razor-shaped: some running high behind, others straight; some with a dip like a valley, others with an arch like a bow. All these forms are met with, and must be dealt with differently. But of all kinds of backs, let me warn you against the high withered horse, with hollows behind his shoulder-blades. This back cannot be made to stand active service, for obvious reasons.

With our knowledge of the theoretical structure of the back, we can see how important it is that saddles should fit. This we shall never accomplish, unless we carefully and systematically set to work to study the conformation of the animal we are about to saddle, and obtain with exactitude the size of the different parts of the back upon which the saddle rests.

Each English cavalry regiment is furnished with a fitting saddle, known as the "Wilkinson patent." It is simply a saddle hinged at the pommel and cantle, and graded so as to record the size and shape of the back. "In fitting a saddle, it should be placed upon the bare back, the front of the sideboard should rest two inches below the shoulder-blade. It must be wide enough to admit the blanket without pinching the sides of the withers, with at least two inches to spare at the top, and follow the exact contours of the ribs: at this part, remember, it must rest upon, and against them in front, as the saddle must get a hold here.

The sideboards must fit exactly the shape of the back: if too oval, or convex, the saddle will rock: if too concave, it rests only by its ends on the back, which will suffer. In front, the weight is transmitted downward and outward: behind, from above only.

The man is now placed in the saddle and these points again examined, the fingers being passed under the front and rear of the sideboards to see that those parts are clear as well as the tops.

Sore backs may be divided into three classes:

1. Injuries to the summit of the spines.
2. Injuries to sides of withers.
3. Injuries to the weight-bearing surface of the back, proper.

The first class (injuries to the top of withers) are produced through the pommel touching those points, from being too wide, or the tree spreading. This must be remedied by a narrower saddle, or two blankets. *No remedy for spreading.*

The second class (injuries to sides of withers) result from a narrow saddle, which rests vertically against those parts, instead of following their contour. The remedy is a wide tree, or smaller blanket.

The third class (injuries to the back, proper) chiefly occur over last rib, and are vulgarly known as "kidney sore." They occur on the near side from extra weight of carbine on off side.

Their causes are various:

1. When a saddle rests on the withers it is higher in front, the posterior ends of the sideboards being driven into the back by the weight of the man gravitating to the rear end of the saddle.
2. That vile seat known as the "barber chair seat," concentrates the man's weight behind, on the ends of the sideboards.
3. The sideboards being posterior to the ribs and lying on these enormous propelling muscles of the loins—these, by their powerful contractions, create wounds by friction against the rear ends of the sideboards.

Loss of flesh, or "waste back," brings the weight nearer the bony column; starvation, or hard work, produces a loss of vitality of the skin, rendering it intolerant of pressure. This can be remedied only artificially by additional blankets.

Saddles suddenly removed from hot, sweaty backs, result in rapid evaporation, producing tender skin, blisters, lumps and swellings. The blanket should be always circled on backs for an hour or two after removing saddles.

If our horses were kept in muscular condition by gentle walking exercise two hours daily, instead of being so fat, equipments

could be fitted to them before starting into active service, which would continue a reasonable fit, as a fat horse must get rid of his surplus adipose tissue before he is of any practical use for service. We can learn a great deal from our experienced packers, who never remove their aparejos from their mules' backs for an hour or two after getting into camp.

On the march men should have at least twenty minutes to saddle their horses, and make their blankets and saddles a comfortable fit, as it is no easy matter to fit a fully packed saddle against time, particularly on windy days. It is scarcely fair or just to saddle against time, and then punish men for saddle sores. Give them plenty of time to saddle first.

One frequent source of misery and injury to our horses is a continual chafing of the cinch strap against the ribs. This strap is clumsy, thick, and too long. The soldier, to get rid of it, rolls it frequently through the quarter strap ring and cinch ring, causing a protuberance, which injures the horse's ribs, and interferes with the man's knee grip.

As a substitute for the crupper and breastplate I strongly recommend the circingle over seat of saddle, and around the abdomen back of cinch.

Every cavalryman should know what measures to adopt in the event of his horse suffering from saddle injuries, how to recognize the cause, and what expedients to adopt to prevent its continuance, for until the cause is removed the effect will continue.

CONVERSATIONS ON CAVALRY. BY PRINCE KRAFT ZU HOHENLOHE-INGELFINGEN.

TRANSLATED FROM THE GERMAN
BY FIRST LIEUTENANT CARL REICHMANN, NINTH INFANTRY, U. S. ARMY.

NINTH CONVERSATION. (MARCH 7, 1886) — OF THE PRELIMINARY TRAINING AND SELECTION OF THE REMOUNT RIDERS.

H. How would you like it if in my special questions as to what you would like to see altered or improved in our cavalry, I should begin with the training of the horse? For a good cavalryman, when speaking of the troops, will invariably think of the horses first.

S. Certainly; and then the first question is to what men to entrust the training of the horses, and what ought to be their capabilities and previous training.

H. There we again have the story of the egg and the fowl.

S. They cannot, it is true, be kept completely separate, one from the other. In the first place I must repeat what I stated before this, that to-day we are spending too much time, work and energy on the riding hall service, and, in comparison, bestow but a stepmotherly care on practical riding. Yet the latter is the more important for the soldier.

H. I have always believed this the natural consequence of our short term of service; three years are not enough to learn riding perfectly. The riders must be taught the first principles in the open or covered riding hall, and there remains then too little time for practical riding.

S. There must be time enough, otherwise there is no sense in the entire cavalry training, whose sole aim is to produce efficient mounted combatants. The ideal is to so train the men as to make them one with their horses, like the wild mounted tribes; they are one with the horse because they grow up with and on it. The old civilized states took mounted tribes in their pay, but their unrelia-

bility suggested to them the idea of themselves training horsemen, whence the riding schools: they are a means to an end. They served to make firm riders of the men, and trained the horses for use in war. It is impossible, especially with our present short term of service, for each soldier to break his own horse; for this a number of men must receive special training. If this is not done, it is at the expense of the thorough breaking and efficiency of the horse. Since want of time does not permit us to train the great mass of horsemen into remount riders and good fighters on horseback, the majority of the riders should be trained solely for the latter purpose. The riding track is to be merely a means to an end, just as the side paces are to render the horse adroit and obedient. The horses are not taught the side paces in order that by this means the rider may shine at the inspections: during the training they are to be used with such horses as are not made supple by the simple, ordinary lessons. Hence the great mass of riders must be kept from the side paces and the tricks of hall riding.

H. Don't you subsequently select the small number of remount riders from this great mass?

S. No; whoever fails at once to show special fitness for riding (which may be observed almost immediately after instruction begins) belongs in that great mass of horsemen who never hear anything of equestrianism, side pace, renvers, travers or "schulterherein."

H. Would not this experiment be hazardous? If, under this subdivision of the service, it should become apparent in the course of years that the great mass does not ride well enough, the whole cavalry would be in a half-raw condition.

S. It is not necessary to make this experiment: it has been made for five years, and I know the particular squadron quite well. The result of the rational, simple manner pursued by a few picked riders in making horses active, was that the horses remained remarkably sound in their legs. Lameness was rare, internal disease still rarer. The squadron came afterward into other hands when work was resumed on the old plan; instead of training a few men for remount riding, the squadron, like most of the others, gave to the great mass of riders a riding hall instruction which they could neither understand nor digest, and which, while doing no good, did much harm. They all "kniebeled" their horses the whole year round, and instead of training, as they thought they were doing, they mistrained them, and no good came of their trouble and work, the squadron got poorly broken and poorly going horses; the men ceased to be practical riders, and their efficiency in the field was

doubtful. After eight more years, what did you behold? The two last annual contingents of remounts trained under the first system were still there and almost complete, while many were missing in the younger contingents. Many of the latter horses had died, many had been condemned as broken down: all were thick and fat, and quite awkward on the terrain; the former lively gait and fresh appearance of the horses had disappeared; you could see lots of side paces, but the horses were not gaited.

H. It is obvious that a small number of remount riders can be rendered more proficient with less trouble than a large one, because the instructor can keep each one under closer observation; and that a small number, when picked from the ablest and most gifted riders, will learn better how to break horses than the great mass, no one will gainsay.

S. Add to this that a trainer of horses needs much practice in riding. Now if such a trainer rides two or three horses daily, he gets more practice than if he rides one horse daily as the other men of the squadron do. It is only by much practice in riding that the pupils are trained to become thinking riders, are accustomed to familiarize themselves with the nature of the horse, to understand its mode of reasoning, to make learning easy for it, and not treat it as a machine, and above all to be fair to the horse, *i. e.*, when differences occur, not to look to the horse for the cause, but to themselves in the first place.

H. What you are saying there, agrees with one of the chief principles laid down by BACHER. He stated that if a horse showed to-day some unexpected refractoriness, some mistake must surely have been made the day before. Major VON LANGENN, from whom I took riding lessons when I was a regimental commander, observed the same principle.

S. And to which any experienced rider will subscribe, whoever wants to become a good rider, to become a good horse trainer, must be always strict with himself and abstain from burning incense to himself. Whoever is incapable of this—it can be learned by practice only—is quick to punish the horse for every difference, including those which are the rider's fault, which most of them are, and perplexes him until he does not know what to do, rendering him all the more refractory and obstinate. If horse breaking is to be a practical success, it must never be done by bunglers or superintended by empirics pure and simple. If everyone be permitted to try his hand in horse training, including those already broken, it is not to

be wondered at that horses die prematurely, become restive and unfit for cavalry service.

H. It is perfectly plain to me that if a small portion only of the men in the squadron are instructed in breaking and re-breaking horses, this small portion will be of more service than if all were continually required to ride according to the second part of the riding instructions. The question is whether this small number of trainers may not become too small.

S. How so?

H. I should think you would be limited in your choice to men in their third year of service, the four-year volunteers and the non-commissioned officers.

S. Why should not there be found among the riders in the second year of service men sufficiently gifted to be instructed in remount riding? The instructor of course should be a good practical rider and successful in imparting instruction.

H. They may be sufficiently gifted, but they must first, on broken horses, learn all the side paces which they are to teach the remounts as part of their training, and that can not be done until after the first year of service.

S. It is quite true that the remount rider before mounting the remount should learn what his aim should be: that cannot be done by verbal instruction. He must learn by practice the feeling he ought to experience when the horse obeys his aids, and which he afterward should strive to attain on his remount. The conception of what this feeling is he can get only on a well trained horse. It is only when he has practically experienced what this feeling is that he can know what to strive for with his remount, and no one is fit for remount riding who does not know what he wants.

H. That is obvious. Now, if a beginner, just through his recruit year and ignorant of the requisite preparatory means and aids, be charged with riding a young, raw animal, he will be stumped, because he knows those aids only with which he has heretofore done campaign riding on a well broken horse. Consequently, the horse will know still less than the rider himself what the latter wants, and fail to understand those aids which are not natural products, but, in great part, of an artificial character; for this reason I think that before a recruit rides a remount he should have another year's training, during which, mounted on a well broken horse, he is instructed in training.

S. That is not at all necessary; he need not train during another year and spoil old trained horses, as is now often the case. It

is sufficient to teach him on old, well trained horses, which at once do what the instructor wishes to demonstrate, the use of the preparatory aids requisite in horse breaking, and to let him feel the effect, that does not require a year's training. The riding instructions say expressly that during the recruit course the most gifted riders among them should be given lively, well trained horses, and be carefully taught by a good instructor. During the summer when, ever other duties permit, the training of the men must be extended, and they should be instructed in the lessons of the second part of the riding instructions. Here the horse must also be instructor if the rider is to learn to understand.

H. I understand you now, will you please tell me what changes you would like to have made in the present methods of training young horses.

S. Before I do so, I must refer to a very important instruction for the trainers which frequently, nay mostly, fails to receive the necessary attention. The horse is by nature distrustful and unforgiving, and once ill-treated does not forget it for a long time; hence its action in the stable and under the rider, always corresponds to the good or bad usage it receives. The better bred the horse is the more prominent is this characteristic. To the cart horse it is a matter of indifference when his oats are poured into the crib under a storm of brutal curses; not so to the well bred horse, the more gently it is treated by the groom the better it will thrive on its food, the more efficient and faithful will it be.

H. It is obvious that a horse rendered distrustful by rude treatment in the stable will be distrustful of the rider.

S. Difficulties are thus often thrown in the way of training by rude and injudicious usage in the stable; we often wonder why a horse is suddenly tricky and refractory, traits it had not displayed heretofore. Had the groom been under constant observation, the cause would not be hard to find, for he certainly beat the horse rudely in the stable or used it ill in some way, for which it now revenges itself. Add to this that men who are rude in caring for their horses, are habitually so in riding them, and thus greatly impair the efficiency of the horses.

H. I think all riding and service instructions lay the greatest stress on the proper management of the horse in the stable.

S. These instructions are, in practice, not observed with sufficient strictness; greater importance should be attached to the mutual effect of usage in the stable and riding lesson than is ordi-

narily the case; the best way would be to let the man who is training the horse be the only one to care for it.

H. That is not always practicable, least of all with remounts whose riders are, in part, non-commissioned officers, still less when you have a small number of trainers most of whom ride two horses.

S. It is certainly not always practicable, but we should endeavor to have the care in the stable go hand in hand with the riding. Where the supervision of the stable and riding are confided to one person, better results are reached than where the trainer simply mounts the horse ready saddled, and to which he is a stranger.

H. I believe that in this particular many officers sin most as regards their own horses, for they do not see them until ready to mount, and do not see them again after dismounting: many an officer visits his stable but rarely.

S. It is to be regretted that such is the case. As to the selection of the rider to be employed in training, I meant to mention that the recruits should be very carefully instructed and supervised in the treatment of the horse in the stable. In selecting the trainers as much stress should be laid on their address in managing the horse in the stable, in understanding its way of reasoning, in gaining its confidence, as on their horsemanship.

H. We have now exhausted the principles that should govern in the selection of remount riders.

S. I cannot express myself fully enough on this subject, and must mention at least a few chief points which properly pertain to the training of the recruit, but for this very reason should also be observed in the selection of recruits for remount riding in the second year. In the first place, the remount rider should have received his first lesson in riding on a well broken horse, as has been stated above. The feeling of the complete subordination of the horse under the rider's will, its quick readiness, the free and unconstrained action, the easy feeling of the reins, the balance of the horse, everything that makes riding on a well trained horse so pleasant, is impressed on the rider, and he endeavors to obtain the same feeling on the horse he is to train; he knows what he wants and is required to attain, for the first requisite of the remount rider is, as we have agreed, that he knows what he wants, so that when the horse does what he wants it to do, he leaves it alone and thus rewards it. The better, therefore, the horses of a squadron are broken, the easier is the selection of remount riders and the easier can they be trained. The recruits under instruction should, therefore, be mounted on the best trained horses with the liveliest paces.

H. It is a universally acknowledged principle, which we also have enunciated, that the horse is training the rider as much as the rider the horse. How, for instance, could a rider get an idea of the proper feeling he ought to experience in his hand, if from the beginning he is put on a stiff-necked horse, which pulls with all its weight on the reins. He will become accustomed to hanging on to the reins and acquiring all the resulting errors in seat and feeling.

S. This principle is frequently acknowledged and proclaimed, and yet it is only too often violated. Sometimes the best trained horses are considered too good for recruits, and turned over to the best riders, with a view of putting sand in the inspector's eyes at the inspection in the hall by tricks performed by a picked class. Next: the pupils selected for remount riding must have a correct seat. Once correct and firm in his seat, he has no difficulty in applying the proper aids. If he sits neither correctly nor firmly, the many unexpected motions of the remount will cause him to involuntarily apply aids by thigh and rein, which in turn irritate the horse. The consciousness of a firm seat gives him self-confidence and courage. The feeling of sitting neither correctly nor firmly makes the rider uneasy. But any one who is uneasy cannot break remounts.

H. Certainly, the horse knows at once when the rider is timid, and then plays with him.

S. The riding instructions contain precise instructions as to the correct seat, wherein all the best authorities on the art of riding concur. In practice the mistake is frequently made by the instructor of following the letter of the riding instructions rather than their meaning. They work according to a set scheme without considering that not all men are equally favorably built, and that some men need more time to acquire a correct seat than others. If, then, in the course of instruction, all are uniformly advanced, the instructor spoils those forever who have not yet acquired the correct seat.

H. The firm seat is not a *sine qua non* condition for properly managing a horse. I have known two riders whose horses always went splendidly, and yet they were thrown frequently.

S. There is a difference between a firm seat and a good seat. A rider may sit firmly and have sufficient strength to cling to the saddle by the strength of his thighs, whatever the capers of the horse may be; but he sits stiffly, annoys the horse, deranges his seat by means of the reins, shifts the pressure of his buttocks when giving a thigh aid, and thus gives unintended and therefore wrong aids by his weight. Such a rider can ride boldly, cannot be bucked off, but

cannot guide correctly, and is unfit for remount riding. Another rider has a firm, supple seat; his limbs act on the horse independently of each other, and exactly according to his will, but he has not the strength of thigh to keep the saddle at unexpected motions of the horse.

H. According to this, the rider who is to be trained for remount riding should have both a firm and a good seat.

S. Exactly; he should have acquired his seat in his first riding lessons; confirmed and assured it during his first year of service in all the exercises of campaign riding, jumping, climbing, "*tummeln*," etc., and above all, in the long gallop, which is the best of instructors. I have frequently heard some rider criticised: "He has a good hand, but no seat." That is sheer nonsense. How can a rider guide well if he does not have a steady, unconstrained seat, and if he allows the management of the reins to influence his seat. Whoever guides well, sits well.

H. That does not mean that whoever sits well, guides well.

S. Not at all; the good seat is merely the first stage. The next is the guiding. A rider may guide splendidly, and yet his hand may be rude in guiding. He must learn correct guiding after learning how to sit; a good, soft hand is a natural gift, like the soft touch of the piano player. Only that rider whose hand, as the riding instructions express it, has become steady, soft and sensitive should be selected for remount riding.

H. The hand cannot be all that unless it be independent of the seat, and the seat independent of the hand.

S. You are quite right. At the same time the rider should have complete control of his body; he must be conscious of what he is doing with every one of his limbs, and be able to move them each by itself and use them at pleasure, without affecting the other members, and making motions not intended, *i. e.*, giving wrong aids. As long as he cannot do that, a proper action upon the horse, as well as the absolute necessary concert of thought with the horse, is wholly impossible.

H. In order to acquire such mastery over the members of the body in detail on horseback, LANGENN recommended setting-up exercises on horseback.

S. They are the only correct means to this end. Reserving to myself the privilege of again referring to this point when we discuss the training of the recruit, I will speak to-day only of the manner in which one may convince himself that a rider possesses the control, indispensable to the remount rider, over the individual parts

of his body. I recommend the following method: The rider is placed on a broken horse, and you place yourself facing him where you can survey him with one glance. Direct him now to move one leg or swing one of his arms, and observe whether the other leg, the other arm, or the rest of his body, remains immovable, or is moved or strained. Then approach, lay your hand flat under the leg or arm which is not to move. There you will be sure to feel whether or not there is any straining. You may also place your hand on the rider's bridle-band to convince yourself whether he holds it steady when giving aids with the thigh, or moving the right arm, and does not cause any feeling in the horse's mouth—a fault easily committed. For it is clear that a rider cannot be expected to act correctly upon the horse until he is complete master of his own body, his arms and legs. As long as he is unable to give aids at will with one hand, with one thigh, to work where necessary without moving the other members or straining the body, he is not fit for remount riding.

H. That is so plain as to require no proof.

S. Yet it is so frequently disregarded that I have not considered it superfluous to call attention to it again and again.

H. But this is not all. The prospective remount rider should be able to feel what the horse is doing with its legs. He should never have to look at them to know. For this reason the instructors in school, campaign and race riding have always prescribed that the rider should fix his eyes midway between the horse's ears. If this is too strictly insisted upon, it is apt to produce in the rider a convulsive stiffness, a state of constraint in the seat, which is at once felt by the horse. The remount rider should, above all, sit his horse without constraint or concern. He should understand the good humor of the young animal, and be able to indulge it if it does cut a few capers. Confidence reproduces confidence.

S. It is very necessary for the rider to know what the horse is doing, and whether and where it does not step as it should, without having to look around for it or bending over, and thus change his seat. For this reason the man who is to ride remounts should know by feeling what is going on under him. The instructor should therefore convince himself during the recruit year that his pupils can do that. At first he makes this test at a halt; afterwards in motion. For instance, the pupil should be asked whether he feels where the horse's feet stand or where they step; whether the one or the other is far in advance; whether the hindlegs are under the body or stand out in rear, or are being dragged; whether they step

into the prints of the forefeet, are placed in rear or by the side of them. By frequent questions of this character the rider is led to watch himself and his horse, and acquire, as it were, the rider feeling.

H. The recruit year would appear to me rather a short period for this purpose.

S. Of course, only a certain degree of success can be gained, for the real rider feeling is a natural gift. It is roused, trained and sharpened if the rider has to render to himself and to others an account of what he is feeling. Furthermore, in order to be able to give an account of what he feels, he must be entirely free and unconstrained when going through any exercise on horseback. This straining is natural and involuntary on the part of one who has never been on horseback and is for the first time placed in this unaccustomed position, so that most anyone is apt to fall into this error at first. This straining, however, is the greatest enemy of the rider feeling, and without feeling, a rational working of the horse, is not possible.

H. You have just stated that the true rider feeling is a natural gift. Is not there a chance of falling short of the requisite number of trainers, if some contingents of recruits do not furnish enough individuals thus gifted by nature?

S. Nature has denied it to fewer men than she has endowed with it. Just observe the men when they ride by themselves. You will observe that when the horse is not stepping correctly, something in the gait displeases them. They endeavor to correct the gait, a proof that they are aware of the fault. If they have not been taught to know the cause of this or that unusual feeling, they are unable to make their efforts at correction in the right direction, *i. e.*, they cannot give the proper aids, though they have learned to apply them correctly when told by the looker-on what is wrong. This feeling should, therefore, be regulated by frequent questioning, and become so well defined in the rider's consciousness that eventually he will not have to be told.

H. Such explanations, I should judge, took place daily in the old high school.

S. I doubt it. The pupils of the old school of the last and seventeenth centuries learned seat and feeling by years of practical riding. Later, about the end of the last and beginning of this century they began to learn, between the pillars, to sit their horses without bridle, the horses going through all kinds of movements. Much practice and much riding educated the rider feeling. I think many

an old troop leader would smile at what I have just said. But the pupils of the old high school did not have to be trained so quickly, that some of them could ride remounts or even become non-commissioned officers in the second year.

H. There is nothing to that effect in the riding instructions.

S. Because it was considered a matter of course. The riding instructions and books on riding are written by good, experienced riders, and for professionals, not for beginners and riding instructors. The rule that only such men as can ride should be selected for horse breaking is therefore considered in that book as a prime requisite which need not be enunciated.

H. If I have understood you rightly, and if you permit me to recapitulate what I have heard, you mean that such men should be selected for remount riding as have heretofore made most progress in campaign riding on broken horses. Next, you require that the prospective remount riders shall have learned how to treat horses properly, that their seat be correct and firm, and their hand light, that they have complete control of all their members, (inclusive of each individual one independently of the others), and lastly, that they have the rider feeling.

S. Yes. But you will observe that frequently quite different principles are followed in the selection of remount riders. Many think that every non-commissioned officer should be able to train a remount, and that inability on his part to do so is a disgrace. What a mistake! An orderly, reliable, educated non-commissioned officer, progressed far enough to be a good campaign rider, is useful in a number of the most important kinds of service in the squadron, though he may not have sufficient feeling and too hard a hand for remount riding. Others believe that all four-year volunteers and all those serving in their third year, and not otherwise employed, should be available for remount riding. Riding requires practice. In horse breaking, however, years alone will not do. Many never qualify for remount riding because they do not understand the horse, or constrain themselves, though they ride for ten years. If, however, a limited number is selected for remount riding after the recruit year, according to the above principles, there is this advantage, that they get more practice in training, because the remount riders taken from the three-year service men train horses for two consecutive years, those from the four-year volunteers, three, and in the last year can be put on horses whose conformation renders training particularly difficult.

H. Would you have a special examination for the purpose of selecting remount riders?

S. Or an inspection? For heaven's sake, no! That would create a special class "drilled for inspection." No; the recruit year is long enough to accurately know each rider, if the riding instructor, and particularly the squadron leader, shows great interest in each individual man.

H. We have spent our time to-day on the subject of the selection of remount riders. I must defer any further question on the training of the horse till our next meeting.

S. But our time was not lost, for you must admit that the selection of the right remount riders is the most important part of the training. How could you expect remounts to be well broken by men who cannot do it?

H. There you are right.

THE NEED OF A STAFF-SCHOOL, AND HOW ONE COULD BE FORMED.

BY CAPTAIN HENRY G. SHARPE, U. S. ARMY.

THE "line" of our army is, fortunately, provided with most excellent schools, and the officers are, moreover, given opportunities to attend the school at Willett's Point. But, with the exception of the Engineer and Medical Schools, nothing is done to advance the standard of our staff corps, or to perfect the officers of the same so that they can intelligently perform the multifarious and varied duties devolved upon them. Such being the facts, it is pertinent to inquire whether the officers of the staff require special instruction in order to familiarize them with their duties, or if they have received such instruction before being appointed in the corps.

The following remarks have special reference to the Quartermaster's and Subsistence Departments. The mode in which vacancies in the above designated corps are filled is familiar to all. The appointments are obtained through political influence, and it may therefore be asserted that the appointees have shown no special fitness or marked qualifications for the work; in fact, in many instances they are absolutely ignorant of the same. The foregoing considerations suggest the following inquiries:

1. What is the character of the duties the officers have to perform? It may be stated in general terms that the Quartermaster's and Subsistence Departments purchase all the supplies required to keep the army in an efficient condition. Enormous sums of money are therefore disbursed by the officers.

2. What opportunities are given them to acquire the technical knowledge and familiarity with business methods which are so necessary to enable them to perform their duties intelligently? It is to be regretted that no assistance whatever is given, and that they are not obliged to acquire the technical information. No instruction

is given in the method of testing the various stores that are purchased; furthermore, the officers are not even provided with books, papers or periodicals on the subject, although there are numbers of such in the country which are so essential and valuable that every business man considers it necessary to subscribe for several.

An inexperienced and uninformed officer may, therefore, pay an exorbitant price for an inferior article, or may reject one of excellent quality offered at an exceptionally low price; in either case the government, and sometimes the troops, suffers in consequence of such ignorance.

Competition is so great in all lines of trade that adulteration and sophistication are prevalent everywhere and in everything, but the officers are sent out in blissful ignorance of such conditions and perhaps are inclined to believe that all men in trade are "harmless as doves." The school of "experience" is the only one they are obliged to attend, and the government pays most prodigally for their tuition. One may attend that school during his entire service in the army, and, unless he takes great interest in his duties and labors hard to perfect himself for the same, will learn practically nothing.

Surely, to turn a man adrift and allow him to flounder about in an unknown sea, rudderless, is not the way to fit him for his stewardship. It certainly is not the policy adopted in civil life, for there a novice is first thoroughly posted in all the details of a business, commencing at the bottom and gradually working up as he shows ability and fitness, before he is given any authority or allowed to disburse any money. With us, we make the disbursements first, and learn afterwards, if at all. One who has never seen a lemon is hardly the man to be selected to buy them, even if we do repose "special trust and confidence in the * * * ability" of such an one.

In time of war an incompetent and ignorant purchasing officer might prevent the successful accomplishment of some very important movement by forwarding stores of inferior or bad quality, and an ignorant commissary officer might, by shipping some article of the ration of bad quality, so reduce the effective strength of a command that an offensive movement would be an impossibility.

The purchase of stores is only one branch of the work of the Quartermaster's and Subsistence Departments, and is usually designated as the accountability; the other branch is known as the administration, and its special functions are to provide means and methods for supplying an army in campaign. To do this we must have a thorough knowledge of the region in which we are to engage

in war, of its resources, the lines of railroad, the general statistics of the country, the local statistics, the fluctuations of the markets, and the annual productions of the various sections. The preparation of this work cannot be deferred until hostilities actually commence. HASENKAMPF says: "As a campaign cannot be entered upon without a plan of operations, it is also necessary to previously form a plan to provide for the supply of the army in the zone of concentration." The questions to be solved are the following:

1. What amount of stores will the army require daily?
2. For what number of days must rations be sent into the zone of concentration?
3. Where should the magazines be established?
4. By what date should the stores be in these magazines?
5. What method of transport should be established for forwarding these stores?
6. What limit should be established for requisitions and purchases?
7. Where should the large bakeries be established?
8. Where should the abattoirs be located?
9. What are the means of transport to attach to the magazines?
10. Whence should this transport be drawn?

The solution of the above problems and the collection of the necessary information are proper work for a staff-school where, likewise, the statistical maps of our own and foreign countries should be prepared. The preparation of the statistical maps of our own country and of Canada and of Mexico will entail a great amount of work. It may be suggested that the preparation of these maps, etc., is the work of the Military Information Division, but surely those who are to use the maps should prepare them, or at least assist in their preparation; and no member either of the Quartermaster's or Subsistence Departments is connected with that division.

The expense of maintaining the proposed staff-school would be practically insignificant, for the two or three clerks needed could easily be spared from the Quartermaster's and Subsistence Departments. A War Department order is all that is required to establish this institution, which is so urgently needed. Everyone undoubtedly will admit that unless an officer is actively employed in a position where there are opportunities to enlarge and broaden his views and increase his store of information, his faculties become dimmed and he loses ground each day. It is a positive injury to immure one in a place where the duties are trifling and of the most perfunctory character. There is no such thing as "marking time" in this busy,

rustling world, and he who attempts it is soon hopelessly relegated to the rear.

For the above reason I am of the opinion that four officers of the Subsistence Department could very advantageously be detailed for duty at the staff-school, and probably the same number from the Quartermaster's Department. A new appointee in either department might then be sent to the staff-school for a course of instruction, and when he showed sufficient knowledge of the work, could be assigned to a station.

It was deemed necessary to establish a school for medical officers, although such officers are required to be graduates of a medical college, and furthermore to pass a very severe examination before being given a commission. If such a school was necessary for medical officers, surely one is needed for quartermasters and commissaries, who are neither obliged to be graduates of any school, nor to pass an examination before being commissioned, nor to know anything whatever of the duties they will have to perform.

St. Louis, Mo., May 10, 1894.

THE COMBAT TACTICS OF A DIVISION*

BY GENERAL MARCHAL, BELGIAN ARMY.

PART I.—OFFENSIVE.

Introductory

THE division is assumed to be in marching formation on the road, moving to meet an enemy who occupies a defensive position, covered by a line of outposts, and who is screened at a considerable distance by cavalry. We shall proceed to study the engagement resulting from the contact of the two forces.

NOTE.—The principles laid down for the division may likewise be applied to a brigade or regiment.

ATTACK OF AN ENEMY IN POSITION.

Action of the Cavalry.

A division on the march sends out its cavalry in advance as feelers. The latter, as soon as it comes in contact with the enemy, will follow all his movements uninterruptedly. Contact will reveal the presence of the opposing force at certain points, but will not usually give sufficient information about its strength and formation.

The greater part of the divisional cavalry should penetrate the screen of the hostile cavalry, drive it back, and seek to reach the heads of columns or the adverse positions. Its advance will then be checked by fire; but the reconnaissance should, nevertheless, be continued on the flanks, for the purpose of ascertaining the extent of the enemy's position. The infantry which follows the divisional cavalry will then aid it in its reconnaissance. If the cavalry is driven back, it will be supported by the leading battalions of infantry. The latter will then form to repulse the enemy's cavalry, and afterwards complete the reconnaissance begun by the divisional cavalry.

*Translated, with the author's permission, by M. M. RAMSEY, Military Information Division, A. G. O., War Department. From "Le Combat de la Division d'Armée," by Major-General MARCHAL, Chief of the Cabinet of the Minister of War of Belgium, Brussels, 1894.

Besides, cavalry offers too vulnerable a mark to be able, unsupported, to carry out its work of exploration, for now that smokeless powder is in use, it would expose itself to the enemy's fire without knowing from what quarter it proceeds. Its scouting parties, by means of the speed of their horses, might possibly be able to cross the open portions of the ground, but infantry alone can succeed in introducing itself into rough country in order to see without being seen. Consequently, whatever may be the outcome of the contact with the enemy's cavalry, the head of the infantry column will have to coöperate.

COMBAT OF THE ADVANCE GUARD.

Reconnaissance and Engagement of the Head of the Advance Guard.

The advance guard is to protect the deployment of the column which follows. As soon as the enemy is sighted, the commander of the advance guard will move to the front, accompanied by the commander of his artillery. In order to complete the information furnished by the cavalry regarding the strength and formation of the opposing forces, he will order a portion of the head of the advance guard—a company at most for a division—to reconnoiter the ground between themselves and the enemy's position. This duty may be entrusted specially to a portion of the rifle battalion attached to the division. A staff officer of the division will follow the scouting party and note down all the information; he will also examine the ground personally.

The ground that is accessible to cavalry will be reconnoitered by a squad of cavalry forming the point of the advance guard; the reconnaissance of the broken portions will be effected by scouting parties of infantry. This work will be performed in accordance with the Field Service Regulations. For this purpose the officer in command of the reconnoitering party will divide the ground into several sections, and will designate the body of troops which is to operate in each one. He, himself, with a small detachment, will follow the main route of the column. He will endeavor to maintain communication with his advanced parties, and to support them as much as possible. He will let them rally behind his lines when necessary.

When the reconnaissance party comes in contact with the enemy, it will confine itself at most to driving in outposts, patrols, or small detachments inferior to it in strength. It will endeavor to take some prisoners. The transmission of intelligence should be effected by the most rapid methods, such as mounted couriers, relay stations,

optical signals, bicyclists, etc. The reconnaissance will be continued during the artillery engagement which precedes the general combat.

Artillery.

The artillery of the advance guard can sometimes render powerful aid in a reconnaissance. It possesses the advantage of being able to open the fight from a distance without becoming directly involved; its fire, by provoking a reply from the enemy's pieces, will disclose his formation.

In determining the location and number of the enemy's pieces, smoke no longer serves as an indication. However, the loudness of the reports which are still sufficiently audible with the new powder, and the violence of the cannonade will allow a tolerably correct estimate to be formed. In addition, lookouts may be placed at elevated points from which an extensive view can be obtained, or other means of observation may be employed.

The officer in command of the artillery will choose a well protected position not far from the route of the column and, if possible, upon an elevation; the position should be from 2,500 to 3,000 yards from the enemy's batteries, and from 1,200 to 1,600 yards from the advanced position held by the enemy's infantry. The artillery of the advanced guard will proceed at a gallop to the position selected. It will be the duty of the cavalry to protect the pieces until the infantry comes up.

The head of the advanced guard will keep on, and go into battle formation on one of the wings of the artillery; its sharpshooters will halt about 600 yards beyond the field pieces to protect them. The commanding officer of the head of the advanced guard may place all his companies in the firing line, or keep one company in reserve.

Engagement of the Main Body of the Advance Guard.

While the head of the advance guard is conducting the preliminaries of the combat, the remainder will follow, keeping itself sheltered. If the reconnaissance has not been able to furnish all the necessary information, the officer in command of the advance guard will often be compelled to drive in the enemy's outposts in his front. In any event, since he himself is liable to be attacked by superior forces, he will ultimately select a defensive position to cover the bulk of the column. The engineer company which forms part of the advance guard will arrange the necessary cover.

So long as the enemy's pieces are heard only at a distance, the advance guard may be confident that it will not have any artillery to deal with in the attack of the enemy's outposts, and may proceed to the attack with only such field pieces as have accompanied the advance guard. But if these outposts are judged to be in force, it will perhaps be prudent to await the arrival of all the artillery of the division before attempting to attack.

It is imperative that the advance guard shall not enter into any serious engagement until the arrival of the officer in command of the column; before his arrival, the advance guard should act only in a demonstrative manner, so as to lead the enemy to disclose his location.

When the main body of the advance guard is to take part in the combat, it will advance in a direct line to the outer flank of the head which is already in position. One battalion will deploy along side of the head, relieving part of the latter, if its front has been too extended. The last battalion will be held in reserve. When this has been done, the advance guard will commence the action by gaining ground towards the enemy's position, so as to allow its commanding officer to complete his observations. It will halt as soon as it reaches the limit of the danger zone of the enemy's artillery fire; for if it were to attempt to push forward, it would probably meet with a vigorous resistance and run the risk of being driven back. It will make an aggressive demonstration while securely maintaining the ground acquired, thus permitting the main column of the division to come up and go into position. The line occupied by the advance guard will mark the position from which the attack will be commenced by the front of the division. During the combat of the advance guard, a portion of the cavalry will operate on the flanks and continue the work of reconnaissance. If the enemy attempts a counter movement, they will endeavor to check it.

The engineers will rarely be required to take an active part in the engagement; their principal duty consists in removing the obstacles which interfere with the advance and deployment of the division. They will often be required to bridge small water courses, or mitigate the steepness of their banks, remove hedges and fences, fill up ditches or gullies, etc.; they will also fortify the outposts which may be occupied.

ENGAGEMENT OF THE MAIN COLUMN

Preliminaries

The division commander will join the advance guard as soon as it is about to become engaged. He will be accompanied by his chief of staff and by the commanding officer of the division artillery. He will leave the general of the second brigade in command of the column, with orders to continue the advance. Immediately upon his arrival at the front, he will assume the direction of the operations. He will receive the reports of the officers in command of the advance guard and of the cavalry, and also the report of the staff officer who has accompanied the reconnaissance. He will hastily examine the position where the enemy has been reported, and the approaches leading to it, and will modify his previous plans accordingly. He will not forget that, in view of the deadly effectiveness of the new weapons, a front attack will be less effectual than ever in dislodging an enemy in position. Such an attack must be combined with a flank movement (ordinarily decisive).

The direction of the decisive attack depends upon a number of conditions, rarely identical in any two cases, among which the division commander will have to choose. He will preferably attack the side on which he can most speedily reach the enemy's line of retreat, and as a secondary consideration, that which presents some point of tactical importance, the occupation of which is likely to decide the victory; and lastly, he will consider how to best avail himself of available cover and points of rest. With the present repeating fire-arms it is more than ever necessary to make only a show of attack on that part of the battle-field that is level and unsheltered.

In order to overcome an enemy well posted it will be necessary to prepare the way for the attack very thoroughly by means of artillery; hence the first order given by the division commander will be to bring up all the batteries. He will then direct the main body of the column to halt before reaching the zone swept by the enemy's guns, and to form in close order somewhere near the line of advance. In front of an enemy in position, who consequently relinquishes the great advantages of immediate offensive action, it will always be advisable to take this preliminary formation, for the officers still have the troops well in hand, and the initial deployment, so important, and after which general direction becomes so difficult, will be effected with system and regularity. And besides, there is no difficulty in forming in such order in presence of a stationary

enemy, for in the present state of the military art, reconnaissances require closer observation than formerly, and the cannonading may be prolonged so that there will be no lack of time for assembling the troops.

The division commander will now order the brigade commanders to turn over their commands temporarily, and, together with the principal staff officers, to meet at a designated place to receive their instructions. He will cause the extra cartridges to be distributed to the infantry in view of the great expenditure of ammunition that will be necessary.

During the transmission of these orders the division commander will decide on the place which he himself will occupy during the battle. The judicious choice of this location is as difficult as it is important. The commander-in-chief should select, as far as possible, a commanding position from which he can see the whole of his forces, the dispositions of the enemy, and the later developments of the conflict; moreover, he must not lose sight of the reserve. He will take care not to be too near his troops, as that might tempt him to meddle with those nearest, to the detriment of the general action.

As a rule the general of a division does not leave his place. But if that becomes absolutely necessary, he leaves an officer there to represent him. At the consultation of the generals and staff officers he will indicate definitely the objective point to be reached, the tactical form which the operations will take, the troops that are to form respectively the attacking line, the support and the reserve, the precise work to be done by each of these parts, the general directions to be followed, the successive positions to be occupied by the artillery, the place of the staff of the division, and last of all the line of retreat.

The course, the force and the progress of the attack are no longer shown by the smoke. Hence, in order that its general direction may not escape him, the commander should maintain constant communication with the troops. The duty of arranging the transmission of information belongs especially to the chief of staff. He will designate the officers who are to be stationed at certain points to furnish information regarding the course which the battle is taking.

The division commander, while giving his orders with clearness and precision, will not enter into details as to their execution. The general direction will be sufficiently onerous for him. He will be compelled to leave to his subordinates the devising of the means to be employed. The instructions then of the general will be merely

directive, with a view to making all the intelligence and all the force at his disposal contribute to the same end.

It is to be added that, with the present tactical methods, from the time when the action commences, it will be impossible to modify the plan of attack. Even errors committed in bringing troops into action can hardly be corrected. On the other hand the astounding effects of repeating fire-arms and the absence of the indications formerly given by the smoke, will often place officers in unforeseen situations demanding instantaneous decision. Hence, a power of individual initiative, possessed by officers of all grades, will hereafter be one of the most important elements of success.

ACTION OF THE DIVISION ARTILLERY AND DEPLOYMENT OF THE MAIN BODY OF THE COLUMN

The artillery of the main body will form rapidly in battery on the ground already reconnoitered by the chief of artillery. This position may coincide with that of the artillery of the advance guard or be in advance of it. In the latter case, that artillery will not leave its place in the advance guard in order to consolidate with the main body of artillery except by order of the general of division. The advance guard and the divisional cavalry will protect the guns until the arrival of the main body of the column.

In the first positions occupied by the artillery a part of the batteries may unite in preparing for the attack of the outposts, but when they come within the effective range of the enemy's batteries, all the pieces will take part in the artillery duel. The infantry that protects the batteries may in certain cases participate with advantage. When favorably posted, it will fire volleys at long range that will annoy the enemy's gunners and facilitate the work of their own.

The artillery duel will soon show the division commander exactly the proper order of battle to adopt. In that order the usual place of the artillery is in the center of the unit to which it belongs. It is in this way that the infantry and artillery can most effectively support each other. The order of battle cannot be governed by any fixed rule. It changes according to the force and dispositions of the enemy, the nature of the ground, the special objects to be attained, and the particular circumstances of the conflict. Still there are some general principles which it will be advisable to follow:

1. It is advisable not to extend the front beyond 2,000 meters, taking into account the space occupied by the division artillery.
2. The wings are to be protected or supported.
3. It will be of advantage to operate by combined units.

4. The division will attack all along the enemy's line. However, the troops are not to be uniformly distributed along the line. On the flank, where the decisive attack is to be made, as large a force is to be massed as the nature of the ground will allow to operate simultaneously.

5. The division by itself will always keep a general reserve. Independently of that, each regiment will also have a reserve. Thus the normal disposition will comprise three principal echelons, viz: battalions of the first line, regimental reserves (second line), division reserve (third line).

6. The division reserve being held in readiness for every turn of fortune, and especially to take part in the decisive action, it is usually stationed behind the interior wing of that part of the division that is to do the principal fighting.

7. The distances from front to rear between the several lines are to be regulated so that each of the latter may be able to come up at the proper moment to perform the part assigned to it.

The division commander having given his orders for the deployment, each regiment will proceed to the place assigned to it. Each of them will be accompanied by an officer especially designated by the commander-in-chief. The deployment will be fully completed before entering the danger zone. When it is done, the troops will advance in such a manner as to arrive on a line with the advance guard as nearly as possible at the same time. In this way the danger of coming up in successive portions will be avoided.

The colonels will precede their regiments and report to their generals, who will give them their instructions in detail, explaining the duty and objective point assigned to each regiment, but without specifying the mode of execution. Each colonel will in turn inform the field officers of the principal dispositions to be made, such as designating the battalions that are to be placed in front and those to be held in reserve, the placing of these echelons, the distance between them, and the work each will have to perform. The brigadier general who has a regiment in the reserve of the division will remain near the regiment in the first line. The other brigadier general will take position in the second line so as to be within easy reach for communicating with the colonels under his orders. The colonels will occupy positions in front of their respective regimental reserves. The generals and field officers will not leave their places except in cases of absolute necessity.

The reserve battalions of the several regiments will be eventually employed to fill up gaps made in the front line and to repel

counter attacks made upon it. They may even be employed to threaten the flanks of the enemy; but in no case should they be engaged in any operation that would draw them beyond the front of that part of the first line which they are supporting.

At the moment of the assault the principal duty of the troops in the second line is to support the first line for the purpose of striking the enemy with it.

The division reserve is at the sole disposal of the division commander: to be ready for all contingencies that the progress of the action may present; to reinforce the first line, to repel flank assaults, and to threaten the flanks of the enemy. It will join in the decisive attack, and occupy the positions gained.

DEVELOPMENT OF THE CONTEST

The defensible positions in front of the enemy will be the first objective points. As they are usually flanked by the enemy's artillery, and even by his small arms, it will be advisable to silence to some extent the fire of the opposing artillery before reaching them. Some battalions from the first line will threaten them at short range in order to silence their fire. These troops will carry the positions as soon as the artillery shall have made it proper to advance.

A part of the troops that shall have gained the advance positions will hold them securely. The engineer corps will prepare them for defense, and they will serve as a tactical base for the attack of the main line. The infantry established in these advance posts will be able to take an effective part in the artillery contest by firing volleys at long range.

With modern pieces, the accuracy, range and power of which are far greater than formerly, artillery can throw its first shots to very great distances; but in order to prepare the way for the action of infantry it will be necessary for it to approach within some 2,500 meters of the objective point, and even 2,000 or 1,800 meters if the ground be unfavorable. At the same time it is never to enter the zone where it would be exposed to an infantry fire of tolerable effectiveness. At the last named distances the artillery duel may sometimes be finished without even moving the batteries, since the smoke no longer interferes with the aim.

During all this time the artillery will be playing the principal part in the action. It will draw the fire of the batteries of the defense, and open the way for the infantry, which, on their part,

will afford it aid and protection. With this view the battalions of the first line will move in advance of the batteries at such a distance that the pieces will not be struck by the enemy's infantry fire. These troops in moving will adopt such order as will expose them least, and in going into position, especially if the ground be exposed, they will preferably deploy in line and lie down, so that at long distances they will be invisible to the enemy's gunners.

In order to open the engagement with the enemy's sharpshooters, the battalions of the front line will form in order of battle. In executing forward movements, the infantry will avoid the ground immediately in front or in rear of the active batteries, so as neither to mask these batteries nor expose themselves to loss, for all this ground is swept by the enemy's projectiles. But as soon as the infantry gets 300 or 400 meters beyond the line of artillery, it may occupy the remaining space in front of the batteries without danger. At these distances, since the smoke no longer obstructs the view, and great precision has been obtained in firing, the infantry are in no danger of being struck by their own artillery. In order to counteract the purely moral effect which projectiles produce in passing over the heads of the infantry, they may be accustomed to them on the polygon, so as to be brought to hear the whizzing of projectiles without being affected by it.

The infantry will not prepare for attack until the enemy's batteries are almost reduced to silence. The artillery will then give the most effective aid by directing its fire against the infantry of the defense. From this moment the part played by the infantry becomes the leading one. The other arms of the service will govern themselves with reference to that one, and the division commander will give such orders that all the troops shall act in perfect accord during the action.

In the distribution of the infantry for a general engagement, the division commander will often find it desirable to designate a regiment to make a demonstration, a brigade for the decisive attack, and keep a regiment in reserve. This division, however, is far from being invariable. The conditions of the battle will alone indicate to the commander-in-chief how to employ to the best advantage the forces at his disposal.

It will be the business of the troops entrusted with the demonstrative action to threaten continually that part of the enemy's line in front of them, in order to prevent their succoring the wing against which the decisive attack is directed. The enemy will thus be de-

ceived as to the real direction of the attack, and time will be allowed the troops who are to participate in the decisive attack, to reach their positions. As the troops making the demonstration are not to engage in real hard fighting, they will have less reserve than attacking force. Their front will therefore be relatively more extended. Thus, supposing that the normal fighting front of a battalion is 300 meters, this front may be extended to 400 or 450 meters in the demonstration.

The efforts of the troops making the demonstration ought to be directed to the acquisition of a very favorable position for their fire, yet one capable of offering a stout resistance, so that it may be held obstinately. They will then second the troops charged with the principal attack, as soon as the latter reach their positions.

The decisive attack will usually be upon one of the flanks. The brigade eventually charged with that duty will devote one regiment to the direct attack of that wing of the enemy which has been selected as the objective point. The other regiment will try to turn the flank of that wing. The regiment entrusted with the direct attack will deploy two battalions in the front line and keep the third in reserve. The regiment charged with the flanking attack will deploy one battalion in the front line and a second battalion behind that, in echelon, extending outward, to cover the outer and most exposed flank. The third battalion will form the reserve.

Here, too, the manner of distributing troops is far from invariable. The commencement will be by the fire of the battalions in the first line and that of all the batteries, which will be made to converge upon the wing to be flanked.

The direct and the flanking attacks ought to be combined. They will be executed simultaneously, although the movements of the direct attack should be subordinate to those of the flanking attack.

The brigade charged with the decisive attack will conceal its movements as long as possible, and adapt its formation to the nature of the ground. As soon as it gets opposite to that wing of the enemy which it is to attack it will make a vigorous forward movement. At the same time the demonstration will redouble its fire in order to lead the enemy to reinforce its front.

The action will be conducted in such a way that the enemy's wing will be overpowered by a superior fire. During the action, immediately after the preliminary dispositions have been made, the colonels will assign to each battalion its objective point, and the successive positions to be occupied as the line of battle moves forward.

The battalion and company commanders in the first line will exert themselves to keep their troops within the limits of frontage assigned to each. They will bring into action constantly the forces strictly necessary to maintain a superiority of fire. They will keep up the firing line, and add fresh stimulus to it, by filling up with reinforcements the gaps that naturally occur in a fighting line, through loss of men, the vicissitudes of the battle and the difficulties of the ground. The colonels and majors will watch with extreme care that the officers under their immediate orders do not get the reserves at their disposal engaged prematurely.

With the repeating arms of long range, the preparatory movements have acquired an importance hitherto unknown. It is near the zone of medium distances that fire produces its greatest effect on the battle-field, and where the hottest fire will be required. Neither theory nor experiments at a proving ground can determine that distance. The nature of the ground will have a great influence. Its inequalities will determine the positions that can be reached without being too much exposed to fire, so that the sharpshooters may continue sufficiently under control, and retain composure enough to fire with precision.

The battalions of the second line, forming the regimental reserves, will take care during the march to advance gradually nearer to the fighting line, so as to be in a position to join in the assault at the decisive moment. This approach is imperatively required of the battalion officers, who ought never to wait for orders to that effect.

The division reserve will occupy successively the positions designated by the division commander. Its direction will be towards the principal point of attack. If, in the course of the action, a counter-attack be made, it will be repelled by the division reserves.

During the entire engagement the cavalry will follow the movements of the infantry, always keeping under cover. It will throw out patrols on the flanks to guard against surprise, and seize upon opportunities for a charge.

The Assault.

The assault will not succeed until the enemy has been decimated by the fire of the attack. The battalions of the first line will therefore be pushed as close to the enemy's position as the ground will permit. All the parts of these battalions, united with the successive reinforcements, will deliver a furious fire in order to drive the enemy from his position.

It is on the skirmish line that the effects of rapid fire will be best appreciated. If the defense has been hard pressed, the signal of assault may sometimes start from the line of skirmishers. The officer who sees the enemy weaken in that part of the position opposite to him, will dash forward with the troops under his command. In that case the adjoining troops, as well as those that follow in close order, will not hesitate to support vigorously this partial assault, or protect it in case of a counter-attack. A success obtained at a single point will soon extend along the whole position.

A similar attempt will have a chance of succeeding in presence of an enemy who may have sustained heavy losses during the preliminary engagements, or who may show manifest signs of weakening. But if the attacking line has become demoralized by the enemy's fire and the losses it has sustained, and is consequently not strong enough to make the assault, it will be necessary in making the charge to bring up other troops that have not yet taken part in the conflict.

A small number of fresh troops will generally be sufficient to carry the enemy's position, but it is necessary to have support close at hand, so as to be prepared to repulse, with well organized troops, any subsequent offensive attempts of the enemy. It is necessary also to support them from a distance, and to adopt in advancing to the attack a compact formation, which alone makes it possible to be ready for every emergency.

The final attack will be made by the battalions of the second line. A battalion taken from the division reserve may be ordered to support them. The leading battalions of the assault will advantageously form one or two echelons, each composed of a line of platoon columns. These little columns, easy to handle, and well under control of the officers, deploy readily, and their flexibility adapts them to maneuvering on all kinds of ground. The battalion of assault taken from the division reserve will follow them in line of columns of companies with wide intervals.

At the moment for rapid fire the assaulting columns ought to be not more than 200 meters from the enemy's firing line, either sheltered or lying down. They will be followed, at a distance of about 200 meters, by the battalion of the division reserve. This arrangement and these distances will of course vary with the occasion and special local circumstances.

The arrival on the line of the regiment assigned for the flank attack will be the signal for the general forward movement. For

this purpose immediately after the rapid firing the firing line will move briskly. It will mask the assaulting columns, which will push it forward every time that it halts to return the enemy's fire. As soon as the firing line attains such a distance that the assaulting columns can reach the position by a single dash the division commander will cause the charge to be sounded.

The assaulting columns will pass beyond the firing line rapidly and charge with fixed bayonets. They will be accompanied by the firing line of the nearest battalions, and followed closely by the assaulting battalion of the division reserve, which will complete the work.

The division reserve will advance and take such a position as will enable it to defeat every attempt of the enemy to regain his ground. The troops charged with making the demonstration will do the same. Throughout this supreme effort the various arms should act in concert and with all possible energy. The infantry of the decisive attack will continue their advance regardless of losses; the artillery will pour a destructive fire upon the infantry defending the position; the cavalry will charge with might and main the flanks of the enemy wherever they can find access. Some batteries will advance on the flank of the assaulting columns in order to support their action. They will extend their fire so as to reach the enemy's reserves when the two infantries are closely engaged.

The attacking troops, incited by the ardor of the officers, who quickly take the lead, and by the sound of all the trumpets, will throw themselves upon the enemy to crush his last power of resistance.

AFTER THE ASSAULT.

The Pursuit.

If the attack has succeeded, the battalions that made the assault will remain in the position acquired and direct their fire after the enemy. They will presently re-form and take every precaution against a hostile return. Some of the batteries will at the same time remove to the position in order to give the necessary support to the infantry disordered by the conflict. The engineer corps will secure the captured position, by speedily putting the important parts in a state of defense.

When the enemy takes up a second position, the contest will be resumed with the same phases. The division reserve and the battalions charged with the demonstration will pass beyond the line of

combat and deploy. The battalions that have previously been in the front and have suffered most will re-form and pass to the reserve, where they will receive a fresh supply of ammunition.

If, after the capture of the position, the enemy beats a final retreat, the cavalry will dash forward in pursuit. The artillery will unite with the infantry in overcoming the resistance of those portions that may still be in good order. While the direct pursuit is going on, a detachment of the three arms will proceed parallel to the enemy's line of retreat to assail one of the wings of his rear guard, if he should halt to take up a defensive position.

Retreat

If the attack fail, the artillery will by their fire endeavor to arrest the advance of the enemy and help rally the infantry and perhaps enable the troops in rear to come on the line. The cavalry and the parts of the infantry not engaged will protect the temporary retrograde movement; and after fresh preparation, the attack will be renewed with all possible vigor.

But if on account of his losses the general of division finds himself under the necessity of giving up the contest, he will place an echelon of artillery and infantry in the rear of that part of the line most threatened, and as far as possible flanking the line of retreat, at some point favorable for resistance, and in such proximity that the retreating line can reach it before being completely demoralized. The troops immediately in front of the echelon will fall back and uncover it. The other portions will fall back in a direction perpendicular to their front. The troops that are pursued will preserve their formation until they are out of the enemy's reach. They will take no part in the resistance until after they have been re-formed.

ENCOUNTER WITH AN ENEMY ON THE MARCH.

When the opposing forces are on the march towards each other, the resulting engagement will always have more of an impromptu character than the attack on an enemy in position, because both parties will act on the offensive at the same time. In combats of this nature the advance guard should assure to the troops that follow them sufficient time and room for deploying. It is obvious how important it is that the general of the division should be at the front from the first, in order that he may make his dispositions quickly.

The part to be performed by the advance guard will be espe-

cially difficult. It will have to move with energy in order to get possession of the points of vantage afforded by the field of action. If it succeeds promptly in that undertaking, it may be able to make the head of the hostile column fall back. That check will often have a decisive influence upon the struggle, and will at least compel the enemy to act on the defensive. But that duty is fraught with great danger to the advance guard, if it is made to do serious fighting. It is for the division commander alone to judge of the situation, and of the plan to be adopted. He will sometimes find himself obliged to reinforce the advance guard; but he will not do this without a great deal of care to avoid bringing on a partial action in which chance and courage would be the principal factors.

If the division commander, in taking the initiative, should by the quickness of his maneuvers turn the flank of one of the enemy's wings, he will have every chance of success in his favor.

In order to hasten the opening operations, the close reconnaissance will have to be conducted very rapidly. The general will give the orders for deployment and for battle at the same time. In order not to lose precious minutes, during which the enemy might become master of the situation, in most instances the main body of the column will not be massed; but each regiment will proceed directly and independently to the post assigned it for action when it is near the zone swept by the artillery. Care will be taken to preserve cohesion in this progressive deployment. The other phases of the engagement are conducted in the manner described for the attack by a single division.

The troops should be often exercised in the movements of such encounters. In this way their mobility and flexibility will be increased, at the same time that an initiative spirit will be developed in the officers, and their quickness of perception will be exercised, and they will become accustomed to decide promptly in urgent and unforeseen circumstances.

PART II—THE DEFENSIVE.

Preliminary Dispositions.

Repeating arms and smokeless powder have considerably increased the defensive power of troops. At the same time the defense ought as heretofore always to be regarded as a preparation for a vigorous offensive, the conditions and execution of which have changed but little.

In reconnaissances by the divisional cavalry the infantry will often be obliged to support them, moving in the probable direction of the attacks. Detachments of these arms combined will often be able, without endangering themselves, to compel the heads of the enemy's columns to deploy, and thus expose his plans of attack.

When, in consequence of the reports of the divisional cavalry, or from any other motive, the general shall decide to act on the defensive, he will select a favorable position in the field, and fortify it strongly. It is always of advantage to deceive the enemy as to the position selected, the forces there concentrated, the development of the line of defense, and the points upon which it rests. This is practicable, especially when the position has been occupied, and is protected by advance posts, before coming in contact with the enemy.

But if, after an encounter, it is necessary to act on the defensive, the general may not always have time to properly occupy the place selected. After the detachments of scouts have been called in, the advance guard will have to keep up the fight until the main body can deploy. This deployment may be affected in line with the advance guard or in its rear. In the latter case the advance guard, after its work has been performed, will need to remove as much as possible to one flank of the position, so as to leave the front of the main body unobstructed, and at the same time extend it. This manner of deploying unquestionably offers the greatest security for the main body; yet, on the other hand, the falling back of the advance guard might have a demoralizing effect upon the troops. Therefore it is preferable to deploy the main body on the line of the advance guard and thereby extend it, provided that the troops of the main body, by so doing, will not be exposed to successive assaults in coming into line. The ground and other circumstances will indicate to the general what mode of deployment is to be preferred.

The engagement of the pickets or outposts will be conducted in accordance with the directions of the "Field Service Regulations."

The positions will be occupied according to the instructions in the "Manual of Field Operations." In order not to lose the benefit to be derived from smokeless powder, natural fringes of woods will be preferred to artificial entrenchments, so as more effectually to conceal the troops. The outer slopes of trenches will be covered with sods or brush that the fresh earth may not serve as a mark for the enemy's artillerists.

Care will be taken not to scatter the troops in front of the posi-

tion. Wherever there are within 800 to 1,200 meters, either in front or on the flanks, any points of advantage to be occupied, such as farm houses, hamlets, prominences, patches of woods, etc., permitting the field to be swept for a distance in the probable direction of an attack, they can be occupied by small detachments. These points can be strengthened defensively, care being taken that the enemy, if he should get possession of them, will find in their defensive arrangements nothing to facilitate an attack on the main position. These posts, which are, as it were, the outworks of the position, are intended to annoy the enemy and to compel him to form at a distance his order of battle, so hard to preserve on a march, or to make wide flanking movements. The defense of the advance posts is not to be maintained at great sacrifice, and consequently the troops that occupy them ought to be withdrawn at the proper time.

On the other hand, the points relied upon for the support of the position, and the posts so near as to be considered a part of it, should be defended with the greatest obstinacy. The front of the defense may extend as far as 2,400 or even 3,000 meters. It may be more if the position be a strong one. The tactical formations of the defense will be analogous to those of the attack.

In the distribution of the forces, about one-half of the infantry will be devoted to holding the position. The remainder will be held in reserve to furnish the necessary elements for a vigorous counter-attack.

The infantry, massed by regiments, will be distributed unequally along the front, according to the character of the ground. At points difficult of access for the enemy, and where the approaches can be defended by fire alone, the battalions of the first line will occupy a front varying from 400 to 500, or even 600, meters, and will keep but a small reserve. In places more accessible to assault the battalions of the first line will form a very dense chain, with reserves of companies and battalions in echelon at a short distance.

The troops of the first line will be placed either in trenches or behind natural or artificial defenses.

The battalions of the second line, in the ratio of one to each regiment of the front line, will be held under shelter about 300 or 400 meters from the first line. If the field affords no cover, they will deploy. These battalions ought to keep the firing line full, and, if necessary, make counter-attacks. It will also be their duty to protect the flanks, which are the weak points of the position. In rear of the wing against which the enemy is likely to concentrate

his greatest efforts, one or two battalions will be placed in echelon at the proper moment.

The division reserve, which ought to be in readiness for every turn of fortune, will, prior to the action, be kept massed and sheltered 1,200 or 1,500 meters from the position. Its further station will depend on the probable part it will have to play.

The artillery will be placed several hundred meters in rear of the infantry, generally massed at some point commanding the field of attack. Breast-works will be constructed for the guns. A few batteries may be assigned to protect a wing that would be especially exposed. The directions relating to the work of the cavalry during the engagement are the same as those for the offensive. The engineers will put in a defensible condition the important parts of the line of action.

So long as the attack is slight the infantry of the fighting line will remain in rear of their positions. In order to conceal their forces from the enemy as long as possible, it will be necessary at first to occupy the principal points in the line of defense hastily and with small bodies of troops.

PERIOD OF RESISTANCE

When the advance posts or the detachments of scouts have been driven in, they will retire by the routes previously designated and join the reserve. The troops at the defensive points in advance of the front will begin the resistance by a vigorous fire.

If the defensive course of action follows as a consequence of an encounter, the advance guard will occupy the position which it may have selected, and defend it tenaciously while waiting for the main body to get ready for the conflict.

The artillery will at first reply to the attacking batteries. It will direct its fire upon the heads of columns, or any extended mark that may appear, at distances of 3,000 meters or less. In all cases it will make the infantry its mark from the time that it appears 1,500 or 1,200 meters from the position.

As soon as ever the enemy attempts to press the attack, the infantry at the front, placed in favorable positions, will at once strengthen its firing lines as much as possible. As soon as the assaulting infantry enters the zone of small-arms mid-range it should be subjected to a heavy fire of infantry and artillery. The first dash of the onset must be crushed at any cost, and all the disposable artillery will be employed for that purpose.

COUNTER-ATTACKS.

With our repeating arms, that are operated with such rapidity and precision, infantry can now repel by their fire any front attack. If they are sheltered, and fire with coolness, and the distances have been ascertained, the assailants will suffer such losses and become so unsteady that if they be once repulsed it will be difficult for them to renew the attack.

The flanks of the position are especially vulnerable, and the defense will above all watch over these points. It is also upon the flanks that he will have to operate in counter-attacks. Besides, a defense that is entirely passive is to be absolutely condemned, for it can reach no decisive result. It must be combined with the offensive by means of vigorous counter-attacks. It is not sufficient to render an attacking force powerless; it must be annihilated.

The principal counter-attack will generally be made on the wing against which the enemy directs his decisive efforts, and on the *outer flank* of the adversary's troops. Its action will then be most effective, for it will reach the enemy's front lines and reserves at the same time, and throw him into the utmost disorder. The most favorable moment for this undertaking is when the assailant, weakened by considerable losses, arrives within a short distance of the line of defense and has brought up his reserves to make the assault.

It is not indispensable that the counter-shock should be made by a very large force. It will be sufficient to employ the regimental reserves, placed in rear of the wing that the enemy is trying to flank, or, at the utmost, one or two battalions from the division reserve. The counter-attack will present the more chances of success according as it is of the nature of a surprise. The detour made to reach the enemy in flank will be as short as possible. The first stages of the combat will be shortened because the preparatory steps have been already taken. The period of heaviest firing will be quickly reached, generally by putting every available musket in the line. The effort will be vigorous, instantaneous and decisive, to throw the enemy into disorder under the fire of a front attack, which must not slacken on any account. The cavalry will protect the outer wing of the counter-attack.

All the other counter-attacks will merely be *sorties*, conducted vigorously by the regimental reserves against the enemy's front, in order to take advantage of his errors, if his attack be discontinuous, and to wear out his forces.

RESCUING THE OFFENSIVE.

If the first line be repulsed, the division reserve, or the available portion of that reserve, will rally it and resume the offensive. In order that this operation may be successful, it will be of advantage, whenever not closely engaged with the enemy, to organize a flanking position. This position will be of most advantage when it can be established at 600 or 700 meters from the first line, and in such a way that it can sweep it with a raking fire. It ought to be, as far as possible, masked from the view of the enemy. It will be arranged with shelter-trenches, or with natural depressions so prepared that the troops may easily make a sortie.

When the enemy has overcome all the resistance of the first line, the latter will fall back towards the wings, so as to leave a clear field into which the attacking troops will rush headlong. These troops will be disordered by the great efforts they will have made in the assault, and their losses will be considerable. It is then that they should be met by a murderous fire from the division reserve, which will complete their disorder. Taken by surprise by a heavy and unexpected fire, weakened by serious losses, deprived at that moment of the support of the greater part, or perhaps of the whole, of their artillery, the attack will be in no condition to withstand a violent shock. The division reserve will seize this brief and critical moment to clear the trenches, dash forward, and retake the original position.

The resumption of the offensive will make it possible to renew the battle; but it should not be confined to that. The attack should be pushed vigorously forward, for it will have just so much more chances of success according as it is sudden and profits by the circumstance that the enemy's troops will still be suffering the effects of a check, and will not have time to re-form.

PASSING TO THE OFFENSIVE.

Pursuit.

After every repulsed assault, the defense will itself endeavor to assume the offensive. With this view the infantry and artillery will harass the enemy with their fire so as to throw him into disorder. The bodies of infantry which have been able to re-form, or which have not yet been engaged, will issue from one or both wings of the line of defense and begin the pursuit in conjunction with the artillery.

The battalions assigned to the defense of the front will continue their fire as long as possible without leaving their entrenchments. As soon as the enemy is fully in retreat, a portion of these battalions will join in the pursuit in the second line. The other battalions will keep their entrenched positions until there is no longer any fear that the enemy will resume the offensive and make a fresh assault. These battalions will join the general movement in pursuit of the enemy.

The cavalry previously operating on the flanks of the enemy will endeavor to reach and cut off his line of retreat.

Retreat.

If the army operating on the defensive be finally driven from its position, the infantry and artillery will retire in concert, and will take advantage of every obstacle to check the enemy by their fire. The cavalry will protect the movement by operating upon the flanks. The place of rendezvous, which will have been selected by the commander and prepared by the engineers, several kilometers in the rear, to enable the disorganized bodies to re-form, will then be unmasked. It will be occupied by all the disposable infantry, and all the artillery which it has been possible to withdraw from the conflict.

When, in spite of every effort, the defense is obliged to abandon the field of battle, the division commander will order marching order to be assumed as soon as possible, covering the column with a rear guard, which will be guided by the directions contained in the "Field Service Regulations."

The cavalry in the rear and on the flanks will watch all the enemy's movements. The general will proceed to view the positions in the rear and decide on the points to be put in a state of defense, and the obstructions to be prepared by the engineers for retarding the pursuit.

In case of necessity, the rear guard will take possession of successive positions to right and left of the route, in order to defend the ground inch by inch. The artillery will protect this movement.

PROFESSIONAL NOTES.

FORAGE RATIONS OF THE AUSTRIAN, ENGLISH AND FRENCH CAVALRIES.

AUSTRIA-HUNGARY.

The ration of forage consists of: (a) In time of peace, 4.2 kgs. oats, 3.4 kgs. hay, 1.7 kgs. litter straw; (b) In time of war, 5.8 kgs. of oats, 2.8 kgs. hay.

For one-half ration of oats may be substituted an equal weight of corn, rye, barley, lentils or vetch.

For one-half ration of hay, one and one-half weight of barley or oat straw.

NOTE.—One kilogramme (kg.) = 2.2046 pounds.

ENGLAND.

In quarters, 10 lbs. oats, 12 lbs. hay, 8 lbs. straw.

In camp, or in other circumstances which are in the opinion of the Secretary of State equivalent to being in camp, 12 lbs. oats, 12 lbs. hay.

The quantity of corn (grain) and hay, or other articles composing the ration of forage, will be settled at *stations abroad*, subject to the approval of the Secretary of State, in such manner, and at such periods of the year, as shall be approved by him, and the amounts so authorized shall be stated in the local regulations of the command.

At Aldershot forage is purchased in open market for issue by the corps, but at all other stations it is supplied by contract.

The daily supply of forage tendered for issue to a corps in garrison will be inspected and a proportion of it weighed by the Captain of the Day (or orderly officer) before its removal from the garrison forage store, and if it is objected to, it must be forthwith replaced by forage of unobjectionable quality.

The following scale of equivalents shows the substitutes which

* Prepared in the Military Information Division, Adjutant General's Office, Sept. 12, 1894.

are allowed to be drawn when necessary: Barley, 1 pound; straw, 2 pounds; bran, $1\frac{1}{2}$ pounds; malt, $\frac{3}{4}$ pound; oatmeal, $\frac{1}{2}$ pound; hay, $1\frac{1}{2}$ pounds; each equal to 1 pound of oats.

Carrots, green fodder, linseed and mangel wurzel, and other articles, in lieu of oats or hay; the issues to be regulated according to their average market value, as compared with the contract rates for the oats or hay for which they are substituted.

FRANCE.

The composition of the forage ration in the French army is now "à l'étude" (January 11, 1893). However, pending the adoption of a new schedule, it is presumed the old rates of issue will remain in force.

Peace and Assembly Footing.

Rations of animals belonging to the troops:

Cuirassiers.—Hay, 3.50 kgs.; straw, 4.00 kgs.; oats, 3.25 kgs.

Dragoons.—Hay, 2.50 kgs.; straw, 3.50 kgs.; oats, 5.00 kgs.

Chasseurs and Hussars.—Hay, 2.50 kgs.; straw, 3.50 kgs.; oats, 4.50 kgs.

Rations of animals while in the remount depots:

Cuirassiers.—Hay, 3.75 kgs.; straw, 4.25 kgs.; oats, 5.00 kgs.

Dragoons.—Hay, 3.00 kgs.; straw, 4.00 kgs.; oats, 4.50 kgs.

Chasseurs and Hussars.—Hay, 3.00 kgs.; straw, 4.00 kgs.; oats, 4.00 kgs.

Maneuvers.

Animals under cover:

Cuirassiers.—Hay, 3.50 kgs.; straw, 4.00 kgs.; oats, 5.25 kgs.

Dragoons.—Hay, 2.50 kgs.; straw, 3.50 kgs.; oats, 5.00 kgs.

Chasseurs and Hussars.—Hay, 2.50 kgs.; straw, 3.50 kgs.; oats, 4.50 kgs.

Animals in bivouac:

Cuirassiers.—Hay, 4.50 kgs.; straw, none; oats, 5.75 kgs.

Dragoons.—Hay, 3.50 kgs.; straw, none; oats, 5.50 kgs.

Chasseurs and Hussars.—Hay, 3.50 kgs.; straw, none; oats, 3.50 kgs.

Rations on Shipboard.

Cuirassiers.—Hay, 3.50 kgs.; barley, 2.50 kgs.; barley meal, 1.50 kgs.; bran, 0.50 kgs.

Dragoons.—Hay, 3.00 kgs.; barley, 2.00 kgs.; barley meal, 1.50 kgs.; bran, 0.50 kgs.

Chasseurs and Hussars.—Hay, 2.50 kgs.; barley, 1.75 kgs.; barley meal, 1.50 kgs.; bran, 0.50 kgs.

Marching Rations.

Cuirassiers.—Hay, 4.50 kgs.; straw, none; oats, 3.75 kgs.

Dragoons.—Hay, 3.50 kgs.; straw, none; oats, 5.50 kgs.

Chasseurs and Hussars.—Hay, 3.50 kgs.; straw, none; oats, 5.00 kgs.

Railway Rations, Either in War or Peace.

Cuirassiers.—Hay, 5.00 kgs.; oats, 2.00 kgs.

Dragoons.—Hay, 5.00 kgs.; oats, 2.00 kgs.

Chasseurs and Hussars.—Hay, 5.00 kgs.; oats, 2.00 kgs.

War Footing.

Cuirassiers.—Hay, 3.50 kgs.; straw, 2.25 kgs.; oats, 5.75 kgs.

Dragoons.—Hay, 2.50 kgs.; straw, 2.00 kgs.; oats, 5.50 kgs.

Chasseurs and Hussars.—Hay, 2.50 kgs.; straw, 2.00 kgs.; oats, 5.00 kgs.

Horses on Grass.

Cuirassiers.—Hay, 0.50 kgs.; straw, 2.50 kgs.; oats, 3.00 kgs.

Dragoons.—Hay, 0.45 kgs.; straw, 2.50 kgs.; oats, 2.50 kgs.

Chasseurs and Hussars.—Hay, 0.40 kgs.; straw, 2.50 kgs.; oats, 2.00 kgs.

Observations.

Rations During Maneuvers.—When animals are to bivouac for a considerable length of time at the same point, there may be an advantage in substituting for 1 kil. of hay or Ok. 500 of oats, 2 kil. of straw for bedding. If the occasion arises for this, the request is addressed to the Minister of War.

Marching Rations.—A substitution similar to that mentioned above may be made on marches by the chief of the corps.

FORAGE RATIONS IN ALGERIA AND TUNIS AND FOR ALL HORSES

Peace and Assembly Footing.

For horses belonging to the troops: Hay, 2.50 kgs.; straw, 3.50 kgs.; barley, 4.50 kgs.

For horses in the remount depots: Same as above.

Maneuvers.

Horses under cover: Same as above.

Horses in bivouac: Hay, 3.50 kgs.; straw, none; barley, 4.50 kgs.

Rations on Shipboard.

Hay, 2.50 kgs.; barley, 1.75 kgs.; barley flour, 1.50 kgs.; bran, 0.50 kgs.

Marching Rations.

Hay, 3.50 kgs.; straw, none; barley, 4.50 kgs.

Railway Rations, Either in Peace or War.

Hay, 5.00 kgs.; barley, 2.00 kgs.

War Footing.

Hay, 2.50 kgs.; straw, 2.00 kgs.; barley, 4.50 kgs.

Horses on Grass or Green Food.

Hay, 0.40 kgs.; straw, 2.50 kgs.; barley, 2.00 kgs.

General Observations.

Circumstances may require that the following kinds of grain be substituted for oats: Rye, wheat, Indian corn, buckwheat, vetches,

horse beans. These substitutions require great precautions: consult the customs of the locality. Other articles that may be substituted for parts of the ration are carrots, barley meal and bran. Under certain circumstances horses may be given mashes or green food.

HORSES AND MULES IN THE UNITED STATES.*

ESTIMATED NUMBER OF ANIMALS ON FARMS AND RANCHES, TOTAL VALUE OF EACH KIND, AND AVERAGE PRICE, JANUARY, 1893.

States and Territories.	HORSES.			MULES.		
	Number.	Average Price.	Value.	Number.	Average Price.	Value.
Maine.....	111,051	\$ 79.84	\$ 8,865,781			
New Hampshire.....	54,039	77.73	4,200,328			
Vermont.....	92,966	68.33	6,352,390			
Massachusetts.....	65,109	102.18	6,652,359			
Rhode Island.....	10,340	100.74	1,041,822			
Connecticut.....	45,313	100.25	4,542,619			
New York.....	669,353	84.26	56,403,020	4,819	\$ 91.13	\$ 439,174
New Jersey.....	87,706	95.71	8,393,915	110.32		924,464
Pennsylvania.....	628,080	78.48	49,289,469	29,210	93.75	2,738,254
Delaware.....	25,553	80.22	2,049,814	4,826	101.85	491,549
Maryland.....	135,685	75.56	10,101,585	13,622	103.06	1,403,879
Virginia.....	248,656	68.91	17,135,626	89,745	89.81	8,059,067
North Carolina.....	133,185	77.67	10,344,475	99,784	86.49	8,630,310
South Carolina.....	60,811	86.64	5,268,668	87,267	95.61	8,344,293
Georgia.....	104,935	81.60	8,562,298	158,043	93.08	14,710,547
Florida.....	32,816	68.30	2,241,349	10,456	91.80	959,850
Alabama.....	123,511	66.03	8,155,435	135,415	80.64	10,930,434
Mississippi.....	159,466	59.54	9,496,396	163,978	75.36	12,357,810
Louisiana.....	132,125	52.01	6,871,827	90,985	79.90	7,289,699
Texas.....	1,246,205	59.01	73,511,400	241,751	48.96	11,845,587
Arkansas.....	190,820	51.97	9,916,082	137,139	64.69	8,871,887
Tennessee.....	321,546	63.32	20,424,624	220,190	63.96	14,081,257
West Virginia.....	158,555	58.06	9,203,705	7,239	67.87	491,277
Kentucky.....	410,420	68.13	27,963,224	153,291	64.50	9,885,253
Ohio.....	891,061	68.74	61,253,716	18,000	75.24	1,354,820
Michigan.....	330,294	76.67	25,259,672	3,783	87.92	332,613
Indiana.....	747,014	70.24	52,470,278	56,557	70.38	3,980,497
Illinois.....	1,377,654	65.03	89,582,790	105,778	68.07	7,200,699
Wisconsin.....	480,479	73.30	35,219,199	5,289	79.66	421,324
Minnesota.....	475,021	76.32	36,255,007	9,757	84.98	829,130
Iowa.....	1,353,791	61.34	83,041,533	40,208	66.90	2,689,972
Missouri.....	988,589	50.72	50,140,250	249,348	57.45	14,324,516
Kansas.....	1,000,594	55.59	55,626,245	92,399	66.95	6,186,270
Nebraska.....	687,822	57.83	39,776,731	46,474	70.63	3,282,531
South Dakota.....	293,800	63.41	18,629,858	8,200	76.77	629,546
North Dakota.....	161,880	68.75	11,128,775	7,840	88.03	690,137
Montana.....	206,862	34.98	7,236,244	1,243	47.10	58,545
Wyoming.....	97,087	30.49	2,938,175	1,368	65.02	88,942
Colorado.....	185,458	44.05	8,169,880	5,236	71.29	373,250
New Mexico.....	91,140	23.31	2,124,474	3,638	40.68	147,976
Arizona.....	52,175	30.00	1,565,250	1,340	50.00	67,000
Utah.....	76,791	31.24	2,398,948	1,825	48.08	87,748
Nevada.....	60,645	40.00	2,425,782	1,688	52.93	89,354
Idaho.....	192,917	36.00	6,945,012	1,053	40.00	42,120
Washington.....	196,115	59.58	11,683,903	1,378	67.50	93,017
Oregon.....	294,509	45.77	13,479,667	4,755	52.47	249,603
California.....	518,824	57.48	29,821,982	60,031	67.90	4,076,130
Total.....	16,206,802	61.22	\$992,225,185	2,831,128	70.68	\$164,763,751

* From the Report of the Secretary of Agriculture, 1892.

ALUMINIUM HORSE-SHOES.

FORT LEAVENWORTH, KAN., Sept. 28, 1894.

Major C. C. Carr:

SIR:—I have the honor to state that the experimental aluminium shoes issued to me for trial were placed upon a troop horse weighing 1,160 pounds, August 1, 1894, re-set September 1st, and removed September 17, 1894, on account of one of the hind shoes breaking apart. The shoes would have lasted three or four weeks if the accident had not occurred.

The excessive amount of wear on the toes was caused by continually stamping and pawing to drive away flies, which were very numerous. The horse was ridden on the road 126 miles, in addition to herding, drill, etc., and when not out was tied alternately on a cinder and rock picket ground.

Very respectfully,

WILLIAM H. CARTER,
Captain, Sixth Cavalry.

BOOK NOTICES AND EXCHANGES.

MANUAL OF MILITARY FIELD ENGINEERING.

Although the *raison d'être* of this little book, as Captain Beach claims in the preface, is simply the necessity felt at the Leavenworth School for a suitable text-book on this subject, it deserves to reach a much larger class of readers, for the same necessity exists in the army at large and in the National Guard as well, and officers who are serving in the field or in camps of instruction will find the book replete with valuable and practical information, which was heretofore only to be found scattered through a veritable library of ponderous professional publications and military serials.

The book appeals at once to the practical man by the sensible way in which it is published, strongly and lightly bound in flexible black covers, clearly printed, without the usual annoying foot notes in fine type, and plainly and profusely illustrated. This latter feature has permitted a condensation of the text otherwise impossible, without obscuring what it is intended to elucidate, and the result is that we have a book which can, if desired, be taken into the field conveniently.

The compiler has limited the scope of the work, in an engineering sense, to those particular constructions with which a line officer should be familiar, and has not increased the bulk of his book by endeavoring to include the subject of military surveying and reconnaissance, which properly deserves a special hand-book, a want which the Department of Engineering at Leavenworth may yet find time to fill.

The reader will find the book conveniently divided into twenty-one chapters, the first three of which are merely introductory, embracing general principles, definitions and field geometry. These are followed by nine chapters on defensive works, embracing clearing the ground, battle entrenchments, field works and their occasions singly and in combination, and the defense of localities.

A brief chapter on siege works treats only of the part played by the infantry in constructing the common trench and flying sap, since the conduct of the siege and the construction of the more difficult works is the proper province of the engineers. Five chap-

ters are devoted to communications, including temporary bridges, roads, railroads, and telegraph and telephone lines, while three are devoted to useful miscellaneous information, such as the use of spars and cordage, demolitions and camping expedients. In the latter will be found many good suggestions relative to the improvement of drinking water, carelessness in regard to which is a fruitful source of fevers and other disorders.

A complete index supplements the division into chapters, so that reference to the various subjects is readily made.

The changes in profile and trace of field work and battle intrenchment, rendered necessary by the increased efficiency of modern arms, has been taken into account by the compiler, and the principle that *the troops who occupy a given position must be able to make the necessary defensive arrangements*, has been fully recognized. The bulk of the work has been devoted to illustrating and explaining as clearly as may be the various simple and effective expedients which will enable troops of the line to do this without the aid of engineer troops, whose superior technical skill will only be available in special cases.

The necessary skill cannot be acquired without practice, and practice cannot be made perfect without previous study as to systematizing the work. This requires either a general manual, something after the manner of Captain Beach's, or smaller hand-books especially prepared for each branch.

Questions of this sort can only be decided by the War Department, and it is hoped that this new compilation may draw attention to this need.

It does not seem out of place to note in this connection that the army is at present without a portable intrenching tool. The non-descript hunting and intrenching knife is not worthy of the name, and will undoubtedly turn out too inefficient to be retained, and must follow the trowel bayonet. European experience seems to indicate some form of light spade as the most effective implement. Be that as it may, the fact is generally admitted that an effective portable intrenching tool is second in importance only to the rifles and ammunition, and cannot be safely omitted from our equipment. These facts are fully brought out by Captain Beach, and it is hoped that his work may reach the wide circulation it deserves and prove a potent factor in remedying our long neglect of this important branch of instruction for troops of the line.

M. M. M.

WASHINGTON, D. C., October 23, 1894.

MILITAER-WOCHENBLATT.

No. 77: Training of East African Troops to Meet Savages Armed With Spears. No. 78: Calling Out of the Reserve Ensigns of the Russian Army for a Second Course of Training. No. 79: Training of East African Troops (concluded). Is War the Inevitable Destiny of Mankind? No. 80: Field Service Regulations of July 20, 1894. Is War the Inevitable Destiny of Mankind? (concluded). No. 81: The New French Drill Regulations. Capture of Kassala. The Chinese Army. No. 82: Preparation of the Infantry Attack by Artillery Fire. The New French Drill Regulations. No. 83: Modern Fortifications. No. 84: Principles of Horse Training and Notes on the Art of Riding. No. 85: Principles of Horse Training (concluded). Points of Interest from the Camp at Krasnoe Selo. No. 86: Notes on Infantry Drill Under Frederick William I. Notes on the American Cavalry in the Civil War, by Lieutenant Reichmann, U. S. Army. No. 87: Military Espionage in Peace and War. French Ideas on the Employment of the Turko in Future Wars.

REVUE DU CERCLE MILITAIRE.

No. 30: The Chinese Navy. No. 31: Marches and Maneuvers in the Alps. No. 33: New Organization of the German Remount Service. No. 34: The Maxim Flying Machine. No. 35: The New German Regulations for Field Service. No. 39: The War With the Moors. The Battle of Sehondelmar (with map).

JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION. 1894

June: Machine Guns With Cavalry, by Captain W. Anstruther Thomson. August: Attacks or Defense Strategically and Tactically Considered, by Captain Maude, late R. E.

PROCEEDINGS OF THE ROYAL ARTILLERY INSTITUTION. July, August and September.

The Breeding Stud of an Indian Prince. Stable Management The French Soudan. Clipping Battery Horses.

THE MAINE BUGLE. July.

With Sheridan in Lee's Last Campaign, by Colonel Fred. C. Newhall.

NOTES ON ORGANIZATION, ARMAMENT AND MILITARY PROGRESS. Military Information Division, War Department. A. G. O., 1894.**JOURNAL OF THE UNITED SERVICE INSTITUTE OF INDIA. April to June, 1894.****THE PENNSYLVANIA MAGAZINE OF HISTORY AND BIOGRAPHY. July.****PROCEEDINGS OF THE UNITED STATES NAVAL INSTITUTE. No. 70.**

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JOURNAL OF THE MILITARY SERVICE INSTITUTION. September.

THE AMERICAN HISTORICAL REGISTER. September.

THE RIDER AND DRIVER. Weekly. New York.

REVUE MILITAIRE SUISSE. July and August.

THE IOWA HISTORICAL RECORD. July.

JOURNAL

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NO. 27.

SOME NOTES ON THE SWISS CAVALRY.

BY CAPTAIN CHARLES KING, U. S. ARMY.

SWITZERLAND will not tolerate the idea of a standing army, yet can throw into the field at a stroke of the pen 300,000 finely armed, uniformed, equipped and fairly disciplined troops—a regular army, in fact, of citizen soldiers and a model National Guard. Dissatisfied with the condition of the levies mobilized to guard the frontier during the Franco-Prussian War of 1870-71, General Herzog, who died last winter at Aarau, evolved the system which has been in force for the past twenty years, and the wonder to an American is that a republic could and did adopt the laws enforcing it at all; but "Switzerland is a republic that has outlived its illusions," said a veteran cavalryman, and contributor to our journal, when referring to the organization in force to-day, and the epigram is the best explanation of the situation.

Perched in her mountain stronghold, surrounded by four nationalities, each of which is forced to maintain an immense standing army, the sturdy little confederation possesses what our American minister resident admiringly pronounced the finest government on the face of the globe. Its system is simplicity itself. Each of the

twenty-two cantons or States sends two representatives to the capital (Berne). These constitute the council of States, corresponding to our Senate. The confederation is parceled off into forty-nine "assembly districts," and the National Council, corresponding to our House of Representatives, is chosen at the rate of one representative to every twenty thousand of people. Then these two houses choose in joint ballot as vacancies may occur, the members of the famous Federal Council, seven in number, each man to serve three years, and every year these seven elect their own presiding officer, and he becomes *ex-officio* President of Switzerland, with the assurance that a second term is out of the question until some other one of the seven shall have had his day. These seven constitute the President and Cabinet. There is no apparent central head, no possibility of a "one man power," and no quadrennial election with the preliminary campaign of abuse, mud slinging, manufactured lies, Morey letters, and similar refinements with which we good Americans dignify the franchise. Once in a while the legislature evolves a law that strikes some of the cantons as too much of a good thing, and if five of the twenty-two can be got to question its wisdom the entire matter goes directly before the people in form of what is termed the referendum. The whole republic bristles with posters publishing the law in full and calling upon the populace to think it carefully over, and on Sunday of such a date to assemble quietly and cast their individual ballots for or against. The vote is generally taken in church after morning service, and the dignity and decorum of the proceeding strikes with amaze an Englishman reared in the traditions of the hustings or an American familiar with the methods of Tammany and the days of Big Six and Boss Tweed. There is no chance for demagogues. There is no possibility, as I have seen in one of our Western States, of whole congregations being marched to the polls by the clergy—a mass of priest-led citizens who can neither speak the English language nor read nor write their own—for every Swiss knows how to read and write. Education is compulsory, and by the same token so is soldiering. The one odd thing about it is, that every able bodied Swiss being a soldier, never once did I see one that wasn't proud of it.

All through Germany and France the uniform is the rule. Soldiers, soldiers everywhere. All through Switzerland, except during the summer maneuvers, it is conspicuous by its absence. The Swiss is taught to respect his soldier garb though never being allowed to wear it when not strictly under orders, and then woe betide the officer or man who appears with so much as a button loose or an

item of his kit awry. The summer the lad is drafted into military service he is sent to the nearest depot, and there at the barracks put through three months of rigorous setting up, squad drill and rifle practice before appearing with his company. The next year he has but ten weeks to serve, the third still less, and after that he turns out armed and equipped as the law directs only when his battalion, troop or battery is mustered for inspection, parade or brief turn at maneuvers. The recruit drills seem to begin at dawn and close at sundown. Then for a couple of hours one sees the sun tanned young fellows, every mother's son in accurate uniform, with shako and sidearms, strolling about the streets or sipping temperately in the cafes, only to disappear entirely just before 9 o'clock. The Swiss in his every-day garb never thinks of entering or leaving a restaurant without raising his hat in courteous salutation to its other occupants. In uniform he halts, faces towards the crowd, stands attention and raises his hand in soldierly salute. He is proud of it, and the people of him.

Switzerland has 3,000,000 people, and all its men, as I have said, are soldiers. America, says MAX O'REILLY, contains 60,000,000 people, principally colonels. With us the National Guard runs to rank. Like ARTEMUS WARD'S celebrated "Baldinsville Light Horse Infantry," we're principally brigadier-generals. We have new crops of them as the result of every election. With Switzerland the run is the other way. The rank and file in their neat, serviceable, soldierly dress one counts by thousands, but subalterns seem few by contrast, captains scarce, majors rarities, and colonels—well, there are four or five kinds of colonels, because the Swiss is an economist. Only two or three officers did I hear referred to as generals, and one of them, HERZOG, speedily died. That grade seems limited to men who have given a lifetime of unusual ability to the profession. Colonels command regiments, brigades, divisions, even *Corps d'Armée*; therefore a colonel in Switzerland might rank with a lieutenant-general in America. At the staff offices in Berne, at the Military Academy at Thun, at the artillery magazines, and at the cavalry "Remonten Kurs," a few, a very few, officers are on permanent duty—the only ones who are under pay—but society is full of soldiers in disguise. The courteous gentlemen who are presented on every hand at evening parties or entertainments as Monsieur This or That, and who are garbed in faultless evening dress, turn out, one after another, to be commissioned officers in the regular establishment. They were not mentioned as captain or lieutenant, because it is not the custom. The fact of their being comrades of

the same profession with the American visitor was not referred to at first, because it is with the Swiss a matter of course. Every gentleman, not a hopeless invalid, is an officer either of the *élite* or the reserves.

But it was my purpose to speak more especially of the Swiss cavalry, or rather of some points in connection therewith. Swiss roads—hard, unyielding macadam—are magnificent for driving or cycling, but they are death on horses. No wonder more than half the animals I saw around Lake Geneva looked knee sprung, and the best mounts to be had in the manège of Lausanne were meek and contrite quadrupeds, fit rather for the tow-path or the kindergarten. A more hopeless country for cavalry cannot well be imagined. What is not magnificent mountain is blocked out into vineyards or farm patches, every little lot enclosed in a stone wall high as one's head, and that in turn bristling with spikes and broken glass. One would hardly connect the idea of cavalry with such a country, but, opening out from Lake Geneva under the beautiful eastern slopes of the Jura, is a wide and fertile valley, drained by the lakes of Neuchâtel and Bienné, and extending nearly one hundred miles in a northeasterly direction towards the upper Rhine. This is Switzerland's field of instruction for cavalry, and here each summer, as may be ordered, gather certain of her mounted regiments and batteries to take part in some well planned maneuvers. I saw them in small detachments on their way to the appointed rendezvous, every trooper in his simple, soldierly garb of double-breasted tunic, reinforced black breeches, top boots, leather shako, with short horse hair plume and plain black belts—no gloves, no ornamentation—and his bridle bits, bossings, saddle and housings were plain as our own, and, though eminently serviceable, never as clean or polished. The saddle looks like a monstrosity, so big, long, broad, heavily skirted, etc., and at first glance I mentally likened it to an aparejo, but it has merits that one would hardly suspect. "We have used it over a dozen years," said Lieutenant-Colonel DE CERJAT, "and are entirely satisfied with it." Whereupon I reached out and hefted one, expecting it to weigh double my Whitman, and was surprised to find it, with all its bulk, almost as light as an English pigskin. Its most striking feature is in the bars. Fancy, if you can, a couple of barrel staves covered with soft leather, placed on the horse's back, concave side up, one on each side of the dorsal vertebra, and the saddle structure firmly attached to them, yet held apart so as to offer free circulation of air underneath, by strong supports, fore and aft, about three-quarters of an inch in height.

Sore backs, they say, are unknown, but as I swung my leg over one of these saddles and settled down into its roomy depths, there seemed to be too much leather under me and the thighs were spread too far apart. There was no such grip as one gets on the blanket, and one or two unnecessary throws I saw on the exercise ground were due, it seemed to me, to the fact that the riders' knees had no purchase on that smooth, slippery surface.

The class of aspirants, young gentlemen seeking commissions in the cavalry, with certain subalterns and selected non-commissioned officers, were undergoing instruction in the riding schools the day I visited the Remonten Kurs at Berne, and found myself standing on what seemed very familiar ground—the center of the tan-bark enclosure. The riding hall was not unlike our own damp, dreary, ill-lighted old barn at the Point, but so much longer that they divided it by a high partition into two of a kind, and the classes were jogging solemnly around the ring in each. Every man was in his appropriate uniform, and the instructor in the first hall—a senior lieutenant who was enough like BLISS, of the Fifth Cavalry, to pass for his twin brother—was conveying instruction in a quiet, methodical way that impressed me with the idea that he looked upon the performance as somewhat tedious. It was mid-winter, and the air was sharply cold. The instructor wore his overcoat, but the class rode in ordinary riding dress, and in the padded saddle used for the instruction of new riders. The Swiss seat would be the extreme of our old dragoon style, or of our cowboy, but for the fact that the rider is taught to draw the leg back and inward from the knee down, clamping the barrel, as it were, as do the Indians with their unspurred moccasins, except that the foot is sufficiently turned to keep the rowels out. It is neither an easy nor a graceful pose, and it was curious to see how soon the more accustomed horsemen—the young officers—dropped it the moment they got into the road or open country. For their own purposes most of the officers seem to prefer the French cavalry saddle made especially for the commissioned class. Several of them who tried the Whitman in the manège at Lausanne, declared its seat and grip far better than theirs, but the ring and the leather knot of the cincha were just in the wrong place according to their views. Their school seat brings these items directly between the lower thigh or knee and the horse, and they do not see how we can sit easily and securely with the knee in front of them and with the lower leg falling naturally from knee to stirrup. Even when a Swiss officer mounts an English saddle, as I saw in the manège at Lausanne, he tries to sit it and to teach his pupils to sit

it "on the fork" and not the flat seat, with the knees gripping the skirts anywhere from four to six inches back of the knee pads of the hunting saddle. Yet I noticed how in riding cross country they speedily braced up the stirrup leather and fell into the English style, rising to the occasion and in the stirrups.

And while on this subject of the seat I may be pardoned for digressing a moment and referring to a matter that attracted my attention and gave me no little surprise, both in Brussels, where the Belgian officers closely copy the French in everything, and in Paris, where, once at least, they set the pace for the military world. Officers out for park riding wore their undress uniforms, but their horses were in what we might call "city;" that is to say, the English bridle and saddle were used in very many cases, so that a military rider appeared on what might be called a civilian mount. Now fancy a fellow dressed for a morning canter in Central Park in whipcord *bouffant* breeches, pigskin leggings, covert coat, Derby and "crop," riding a horse caparisoned in cavalry bridle, Shoemaker bit, McClellan saddle with hooded stirrups and blanket. Viewed from the horseman's point, is there anything more incongruous in a "city" rig for the rider and military, ditto for the horse, than there is in a military garb for the rider and English park or hunting rig for his mount? If in uniform, why not *all* in uniform? Ever since the fog end of the civil war when I saw a man in the complete uniform of a captain of infantry solemnly promenading Broadway, topped by a tall silk hat, have I ever gotten over the hatred of the incongruous in soldier dress and equipments, and having been told that Europe was the place where they did everything in proper style, I looked to see it and nothing less. Germany and Switzerland were all and more than fancy painted, but France and Belgium rubbed my old fashioned fur the wrong way. It is an actual fact that, standing on the Avenue du Bois de Boulogne one lovely February morning, watching the riders trotting home from their hour or two of exercise, I counted over ninety officers within forty minutes who rode with toes and elbows "akimbo," and with the reins in the right hand. Inquiring of a French friend as to why the right instead of the left hand was used, resulted in the information that he had never noticed it before and really didn't know, and within the next twenty minutes only one of over fifty officers who passed had his reins in his left, and the constant shifting of the reins as they used the right hand to tender or acknowledge salutes seemed awkward in the extreme.

As for the horsemanship it looked in most cases ungraceful, but,

like the English, was probably considered good. There is a marked difference, however, between the riding of Englishmen, soldier or civilian, and that of the French officers.

To return to the Swiss cavalry. A saunter through the stables of the Remonten Kurs, scrutinizing the horses, the stalls, the equipments, the methods and mannerisms of the officers and men, was full of interest. I could not but note that the officers were to the full as precise, punctilious and "military" as are the Germans, but there seems far more *bonhomie* and sympathy and kindness, if one may say so, between the upper and lower grades, especially in the cheery mess room or in off-hand chat. As in our own democratic, free and easy service, the juniors do not seem to hesitate to impart their views and impressions to their superiors, except when strictly on duty. The handsome, soldierly, dark green tunic of the cavalry officer seems the uniform of a military brotherhood, and despite the fact that the colonels and lieutenant colonels have had to serve as long and to grow as gray as we do before reaching a majority, and that many of the youngsters come up as aspirants at eighteen, there is an air of good cheer and *camaraderie* about them that rather exceeds anything of the kind I ever saw, at least in the rough old frontier days.

But the most surprising thing about the whole system was the method by which Switzerland maintains a large mounted force, keeps it "masked," as it were, and what is most remarkable, maintains it at comparatively trifling expense.

All told, there were not at the Remonten Kurs two hundred horses. There were no other cavalry stations in that part of Switzerland, and I wondered where on earth the horses were to come from when such and such a brigade of cavalry was called out for summer maneuvers. The answer was simple: every trooper had his horse, with his arms and equipments, at home.

Now just imagine the intricacy of that system. The Swiss Department of War has its accurate record of all the young lads growing up toward manhood, their age, birthplace, home, school reports, acquirements, proficiency, and I don't know what all. Among other items recorded is the financial standing of the boy's parents. Into the infantry may be drafted the sons of bankers, lawyers or peasants, but into the cavalry go only those who can carry with them a certain sum of money, say fifteen hundred francs. Horses cost much more than they do with us. Most of those now in use in Switzerland were bought in Pomerania, many in Ireland, and they represent an expenditure of from two hundred and fifty to three hundred

dollars apiece when delivered at the Remonten Kurs at Berne. The descriptive list made of each horse on reaching Berne is something far more intricate than ours, as it covers every surface blemish or discoverable bruise or scar. Experienced horsemen take charge of their earlier education, so that each year's crop of chargers is in docile shape by the time the recruit class arrives. These young fellows in turn are put through their setting up and school of the trooper drills, and then, when fairly well advanced in horsemanship, a charger is assigned to each, and the cost price of that animal—twelve, thirteen or fifteen hundred francs, as the case may be—is handed over by the embryo trooper to the depot adjutant, who gives his receipt. During the rest of his three months' summer service, the young soldier grooms, feeds, waters, rides and exercises that horse, and then, the summer school of instruction ended, takes him home. Horse, horse equipments, arms and uniform go with the new soldier to his native heath, but his responsibility ends not there. He has not only bought the horse, but the government requires him to take the best of care of him. He may ride, drive or put him in the plow, but he must treat him with every consideration, for, every now and then, all unheralded, an inspector drops in and compares the descriptive list of the early summer with the condition of the horse up to date, and every new scar or blemish costs the recruit just so much in fines, while if the horse show neglect or abuse, he is taken from the owner, sent back to the Remonten Kurs to be goddled into condition again, and then returned to his luckless rider with a bill for *double* the cost of care and transportation—a bill that must be promptly paid or more, and worse, follow. Another inspector swoops down and demands to be shown the kit of horse and personal equipments, and woe betide the wight who cannot show every item in perfect order. That is his "plebe" year in the cavalry, and not three, but nine more are ahead of him. During his yearling summer, the second, the young trooper returns to duty for perhaps ten weeks, and that year, on returning home with his horse, one-tenth of the purchase money is refunded. The third summer duty is still shorter, but the intermediate inspections have been just as frequent and strict. Another tenth is handed back as he goes home, and so, at the end of ten years, every cent has been repaid. The horse is now the time-expired soldier's, to do with as he may will, but the best ten years of the lives of horse and man have been the republic's own, for at any instant both could be called into service.

Fancy such a system getting a foothold in America.

As cavalry, pure and simple, the Swiss horse can never hope to compare in dash and drill with that of the European military nations, but it is a remarkably efficient body of mounted men, fit for excellent dragoon work, and for much of the duty that will fall to the lot of cavalry in future wars.

An interesting feature in connection with the Swiss system is the maintenance of a society of officers for the study and discussion of military topics, something akin to our Lyceum. Each large city has its *Sous Section*, and that of Lausanne was remarkable. It was my good fortune to be able to attend a session one evening last winter, and to find assembled in a special room of a quiet restaurant some forty gentlemen of every rank from corps commander down to second lieutenant. The long wooden tables, the quaint old high backed chairs, the wainscoting and decorations of the apartment, the flagons of Swiss wine, the language, the soldierly courtesies were all those of an older civilization than ours, but one glance at the blackboard whereon were displayed the maps for the subject of the evening, and even a shelled old Yankee dragoon felt himself on familiar ground, and when, without preface or introduction, the lecturer of the evening stepped forward, picked up his pointer and begun, every sound but that of his voice was hushed, and for one hour, without referring to a single note, without hesitating for a syllable, without an instant's break in the smooth, rapid flow of his vivid and picturesque description, a veteran division commander described the field and fight of Gettysburg. Even to the oft neglected combat on the far right flank—the glory of the old Second Division of the Cavalry Corps of the Army of the Potomac, it was admirably told. No wonder they proudly referred to Colonel Lecomte as the historian of the Swiss army.

CAVALRY INSTRUCTION.

BY LIEUTENANT COLONEL GUY V. HENRY, FIFTH CAVALRY,
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WHILE at Fort Leavenworth recently, as member of the Prison Board, I was asked by one of the Executive Council of the CAVALRY JOURNAL, to write an article for the December number. I hesitated, as so many valuable ones have appeared in the JOURNAL, and the subject now chosen so well covered, that anything more might carry little or no information.

The recent command at Fort Myer of troops "F," "K," "A," and "H," of respectively the Seventh, Ninth, First and Eighth regiments of cavalry, which I had the honor and pleasure of commanding, have been so prominently (owing to their location at the National Capital) brought before the public and the army, that I propose to give an account of our methods of instruction,—not as a model for others, but in hopes it will explain the efforts we made to make what was considered an efficient, well drilled cavalry squadron.

The individual training of the trooper mounted was paramount, as without this no assemblage of troopers could attain success; he was taught that the correct seat was that assumed on the horse without saddle, or bareback; that with the saddle and stirrup his foot had to be as required by the drill regulations, the heel lower than the toe, giving an advantage of more gripping power to the upper muscle of the calf; but to gain ankle play, which is essential to comfortable riding, the foot could be horizontal, so as to give as much up and down motion as possible; and this is necessary on long marches. Long stirrups, with toes pointed absurdly to the front, the stirrup being lost at every rough motion of the horse, were forbidden.

To move forward. The trooper had strongly impressed upon him that his horse had to be gathered or collected, that is, bridle

hand elevated, legs closed in rear of the girth, so that the horse squirmed over his center of gravity, and at command of execution and lowering of the hand, the horse moved at once. Usually you find at the preparatory command silent indifference or inaction on the part of the trooper; at the command of execution a jab of the heel or spur, causing a sudden and irregular movement to the front, and this method was found almost universal with intelligent troopers.

To move backward. Same as above, except at command of execution the hand was alternately lowered and raised, allowing the horse to gather himself for each movement to the rear, and the trooper not allowed, as is usual, to maintain a constant pull on the reins, but to relax the bridle hand as is necessary.

To turn a horse on the forehand, to the right or right about, close the right leg in rear of the girth and carry the bridle hand to the right. A recent work on horsemanship says: "To teach a horse the reversed pirouette, a movement in which the horse carries the croup about the forehand, say to the right, the rider will bring it to a halt and demand some degree of union of the extremities, by a pressure of legs against the flanks and a light tension upon the reins; this corresponds to our 'gathering a horse'; he will then bend the head slightly to the right by an increased tension of the right rein, measured by the left rein, and increase the pressure of the left heel until the croup takes one step to the right, the forehand held in place." In our regulations the hand is carried to the right for this movement as described above, but we close the right leg instead of the left as given in this book—to my mind our method being correct.

To turn on the haunches, moving the forehand; a horse being in a corner of the riding hall, the only practical way of explaining position; to turn to the right, close left leg in front of girth and carry bridle hand to the right, the horse yielding to pressure of the leg in front of girth, moves his forehand out, turning on his haunches. To do it in the open to the right, you have to close the left leg in rear of girth to keep his haunches in place, acting as the side of the riding hall when in the corner, and carry bridle hand to the right, a movement not easy to execute. The book referred to does not recommend use of leg in front of girth. A horse, however, educated by taps of a whip on shoulder in front of girth or on flanks in rear, will yield on closing of leg in front or rear of girth to its required indication.

Right passage or pass. It is customary for the trooper at the preparatory command to do nothing, instead of carrying his bridle

hand to the right, closing his right leg, and getting his horse in a quarter direction to the right. At the command of execution the left leg is closed in rear of the girth, the horse passing to the right, shoulders in advance.

Then the flexions of head and neck were required as laid down in the drill regulations, which book is replete with all necessary information to make horsemen or to train horses, and the above exercises are for horses as gymnastics for men; and while the results may not be so great as when commenced earlier or on younger horses, they should not in either case be neglected, for the more a horse is handled intelligently the better. However favored by nature a horse may be, he requires these preparatory exercises, suppling of head, neck and mouth, as well as properly taught body movements, to enable his forces to afford each other mutual assistance. Without this instruction everything becomes mechanical and hazardous, not only for man and horse, but fails as well to make a perfect horseman, upon which depends a successful troop, squadron or higher drill. It is not possible to take too much care or enough trouble in suppling the neck, and getting the position of the head and neck which results from it. If you are master of the head, you are master of the horse; the neck and head are the rudder, the helm on which all depends. It is only through the right position of these a horseman can control the hind quarters. The horse must carry himself with head and shoulders not hanging heavy and dead on his rider's hand, but light in the mouth.

The following from BACHER is applicable, and shows the importance of individual training to obtain collective results, and these can only be accomplished by unremitting daily work and attention to details. Better a drill of fifteen minutes, every move being characterized by promptness and alacrity, exactness and simultaneousness of movement throughout the whole, than one of hours' duration, any movement of which fails to carry out the above. BACHER says: "What musician could draw melodious sounds from an instrument without having exercised his fingers in handling it? He would certainly, if he attempted such a thing, produce false, discordant sounds;" and the same thing occurs in horsemanship when we undertake to make a horse execute movements for which he has not been prepared.

Jumping. The trooper was taught to approach the bar at a moderate gait, not to rush as is usually done, this being dangerous to man and beast, and preventing the trooper from collecting his horse or gathering him for the effort; giving him his head as he

goes over and sustaining him as he comes to the ground, not, however, jerking him, but feeling his mouth. The gait of approach was the trot, and the rule urged that the higher the obstacle the slower should be the pace, the more closely united should be the forces, and the more vigorous should be the action. In a broad jump the speed should be rapid enough to give momentum, but it should not be so fast that the horse cannot collect himself for the exertion. Jumping horizontally or a ditch, a horse is given his head, and not raised or collected, as in a vertical jump. Ditch jumping is a more valuable practice for the cavalryman, as an obstacle more liable to be met with in service; a fence can be pulled down, but a deep ditch not so easily filled, under fire.

The cavalry seat is not the *best for jumping*, with the almost split stick style; you are bound to leave your saddle under a rough or uncertain jumper, which does not look well, and is dangerous on a McClellan saddle, as liable, on the coming down or being thrown forward, to lead to some injury. I found from experience, the following modification of seat a valuable one for jumping. Approaching the ditch or hurdle, raise your knees, throwing them to the front, the thighs having a horizontal brace along the saddle bars, filling the saddle seat, making a wedge-like position, preventing any horizontal movement of the body; the legs from knee down are thus thrown in front of the girth, giving a grip around a smaller surface than in rear or near the girth, and the clinging thus made possible prevents any vertical movement or leaving the saddle. Many adopted this seat for jumping with the best results. The men had an object lesson in jumping through the courtesy of Mr. S. S. HOWLAND, bringing his horse "Ontario" to our riding hall, which with a collected gait and slow motion, cleared our six-foot jump as gracefully and easily as could be imagined. Owing to cross lights in the hall his seven-foot jump was not attempted.

After the above, the troopers were united in sets of fours, and when placed in troops the best instructed men were made Nos. 1's and 4's, and the drill regulations by squads, platoons and troops carried out.

Daily at 9 A. M., Saturdays and Sundays excepted, troop drill of forty-five minutes was had, then adjutant's call sounded and line was formed for parade, followed by an hour's squadron drill. At this drill we first formed close column, and had what may be called our "setting up" drill, exercises for flexion of horse and exactness or simultaneousness of all movements to follow. These lasted from five to ten minutes, and were as follows: First, Forward, guide

right, trot: seeing that every horse was gathered; March: that the squadron moved as one man. Second, Halt: same uniformity. Third, Backward, march: all the requirements being exacted. Fourth, Right or left pass: same. Fifth, Fours in circle, right wheel, trot, march. Here the results of proper instruction of "turning on forehand" come into play, for without the pivot trooper turning on his own ground, the movement cannot be made with uniformity. While circling to the right at a trot, without halting the circling was reversed to the left. This required a most careful handling and control of horses by all troopers, particularly the pivots. To do it and keep dressed a command has to be well drilled, and I want no better test of efficiency than the proper execution of the above five requirements. In addition, distances were taken to the front, and horses turned on forehand to the right or right about. The horses now being "flexed," the drill went on with movements of the four troops as of one man. Of these as many as possible were executed and every available space utilized for maneuvers. This method kept both officers and men wide awake by the rapidly changing commands and celerity of movements, always at the trot, the gallop, except for charge, being the exception.

Our drills commenced—instead of ending, as laid down in the drill regulations—by jumping, usually in column of platoons at a trot, over bar or hurdle three feet high, every man keeping dressed and no distances being lost. All squadron drills were terminated by a passage in review in column of platoons at a trot, troops commanded by first sergeants and officers joining the reviewing officer.

We drilled at many movements not laid down in drill regulations, making the squadron compact, pliant and flexible, and keeping the men's attention in anticipation of an unexpected move, as would occur in action. Two troops would be placed at one corner of the field and at the opposite corner two others, and operating on the diagonal line connecting the corners; one command would threaten the front or flank, or both, of the other, a movement liable in war, as under cover of dust the front of the command makes a demonstration to conceal the movements of those in rear, who have moved off for the real attack on the flank, the front movement being only a feint, and the following of its retrograde by the enemy exposing his own flank.

We used, when in column or line, the formation of troops in double column of fours. When in double column of fours on the center, skirmishers were formed to the right and left front and both flanks at the same time, a probable formation in defense of a convoy.

Being in column of fours, left into line of platoon columns, or on right into line of platoon columns—useful formations for forming columns of attack of platoon columns, charging as they in succession form or when line of platoon columns is formed.

In the "form for attack" from close column, pistols or sabers were drawn, as directed by squadron commander, at the command, "March," the first troop moved to the front at a trot, the second to the right, the third to the left, when the second had gained an interval of fifty yards (or other designated space), it wheeled by fours, moving to the front; the third troop similarly to the left, the fourth, with squadron commander, being held as a reserve. With pistols drawn, the commanding officer sounded "As foragers," when the three advanced troops under each captain deployed and charged as foragers, firing pistols, then rallied, drew saber, charged in line, and dispersed for the mêlée, the guidons of each troop falling in rear of their troops. At "To the rear," sounded by squadron commander, each troop, following its guidon, moved to the rear, till the squadron commander sounded "Rally," when each troop rallied rapidly in rear of the reserve, the troop farthest in rear being last in column, and so on, no troop cutting into another, then the command charged as a squadron. If sabers had been drawn in the first place, the "charge" was sounded for execution by captains as above, omitting "as foragers." They were taught that the cavalry which can rally most quickly and re-form remains master of the field, and gains the victory.

Road exercise by squadron was had frequently, taking the trot, and marching four to eight miles in the time prescribed by the drill regulations, not an interval being lost, no crowding up or falling back, but a cadence of motion throughout the squadron, as regular as the motions of a clock's pendulum. This road was marked by posts, each one mile apart, the officer at the head of the column regulating the march, so that each mile was made in seven and one-half minutes. The rate of eight miles an hour is slow, but one which any horse ought to be able to take and keep, and enables a commander to know what each horse is doing and what more can be expected without injury to his command, by requiring of a slower gaited horse a constantly increased gait, to keep up with the faster gaited, which will in a day's march seriously affect the condition of a command for subsequent work. This practice, combined with a walk, is most valuable previous to the commencement of a march or campaign, distances being increased daily, but a march of thirty miles, fifteen from post, and return, could with ease be accomplished

between 6 A. M. and 12 M., or back in time for dinner. These rides and reports of same should be required by the regulations and made uniform throughout the service, and thus bring better results, more interest, and a knowledge of a horse's power not shown now by daily routine drills. The regular drill, preceded by a four-mile trot—not by troop, but by squadron or regiment—would be beneficial. A cavalry command thus hardened by fifteen to twenty miles a day, for one month, should be able afterward to make fifty miles a day as long as required, and with proper food supply to a command so hardened, one hundred miles in twenty-four hours ought to be easy. The horse, like the athlete, needs training, and when this is done his endurance is limited only by that of his rider. When the road exercise was to take place, “To horse” was sounded, when men ran individually to the stables, saddled, mounted, and formed at a trot on troop parade ground. When each troop was assembled, the captain moved his troop at a trot, on the road designated for the day's march. Men were taught celerity, and great rivalry existed among the troops to be first on the ground, or at the head of the column for the day.

The conduct of a cavalry march is the most important part of cavalry instruction, and upon the uniformity of gait throughout the column depends its efficiency.

Squadron inspection. In addition to review and inspection, each troop was required to go through the “flexions,” which preceded our squadron drill, horses required singly to leave ranks to see if they could do so without reluctance, to establish Cossack and vedette posts, advance and rear guards. Each troop had its pack mule, and packers were present and their efficiency of packing tested. I look upon this instruction of packing as almost equal in importance to that of drill. Our pack trains have been broken up and civilian packers discharged, and we must retain the knowledge of packing by constant practice, for at a moment's notice it may be of vital importance to the success of a cavalry command. Such an one, with a good pack train, can go any place at any time, and is much superior to one “tied to wagons.” Your packs keep up with you and need no guard, and with light loads can march as far. Except in inclement weather, all our inspections were mounted, and after a captain's inspection, on Saturdays, he took his troop out for thirty minutes' “road exercise.” Mounted guard mount was had on Saturdays and no foot drill took place at post.

Riding hall. On stormy days this was used for drill, each troop having it for one hour, alternating in its use, in fore and afternoon.

The requirements of the drill regulations were carried out and latitude when at ease for any gymnastic exercises desired by troopers. We found that to throw a horse, while mounted, pulling his head to one side and to the rear, throwing weight in desired direction, accomplished the purpose, and when down it was not necessary with an unwilling horse to sit on his head, as is usual, but simply to pull the upper rein, his head being raised and bent to the rear, thus preventing his resting it on the ground as a place of support to raise himself. When firing over his body, the foot placed on the rein on the ground, near the withers, accomplished the purpose. At our Friday exhibition drills, which attracted hundreds of visitors, each troop in succession drilled twenty minutes, three using blanket and surengle, one saddle, without girth or cinch, the regulation bit being used. At other times troop commanders had horses equipped as desired, but care was always taken to see that uniform gaits were kept in all drills. After the Friday drill, the pack mules were brought into the hall, cargoes taken off, and at command replaced, each troop being timed, mules turned loose, and every opportunity allowed to test security of cargo.

Road maps. Our non-commissioned officers were taken out and maps of roads were made, in some cases showing much talent, and with all a desire to learn this valuable duty. The battle fields of first and second Bull Run and Antietam were visited, and the local features of each explained to troops by their officers. Limited appropriations prevented a visit to other fields, two troops, however, were ordered to Gettysburg.

Swimming horses. While at our target range on the Potomac, troops were practiced in swimming horses—a most important part of a cavalryman's instruction, and so much neglected. No ordinary stream should stop or delay a cavalry command, but it is well to ascertain by drill what horses can swim. Some do so better than others; the majority, however, all swim, but practice gives horse and man confidence. To know that your horse is a good and willing swimmer is a great advantage, and removes any hesitancy in entering a stream which otherwise would be approached with doubt if not dread. Some horses swim very low, others high. When in the Third Cavalry, one in my troop, from keeping so high out of water was nick named “Portoon Bridge.” Again, some have, till remedied, a trick of throwing themselves backward, all of which has to be discovered and corrected. When in the water on the horse's back lean well forward, hold on by the mane, give the horse his head, do not bear on the reins, pulling his mouth under water.

but guide by splashing water on the side of his face in the direction desired.

The carrying out of all these requirements of instruction would have accomplished little or nothing if done in a perfunctory or indifferent manner. We appealed to the men's pride, and aroused their interest in all duties, to which they most heartily responded. The usual cavalry motto of many "to get there" was supplemented by the manner of "getting there," condition of man and beast before and after, which to obtain maximum results or successes with minimum losses or failures, requires of the cavalryman a constant, daily, unremitting attention to all details of instruction.

In the above hastily expressed thoughts doubtless a great deal has been said already known and from which nothing is to be learned; if practiced, however, faithfully and constantly, a well drilled troop or squadron will follow. It cannot be impressed too strongly upon our cavalry that nothing is too small to attend to, that no man will ever attain to great things to whom small things are too insignificant. Let us leave nothing undone to bring our arm of the service to its highest degree of excellence, so that when war comes we may reap the fruit of seeds sown in time of peace.

King **FREDERICK THE GREAT** said: "Soignez les details, ils ne sont pas sans gloire; c'est le premier pas qui mene a la victoire."

THE NEW DRILL REGULATIONS AS THEY APPLY TO THE AMERICAN VOLUNTEER

BY CAPTAIN C. G. AYRES, 15TH INF. CAV. REG'T, U. S. ARMY.

THE new drill regulations are not suited to the volunteer forces of this country, for the reason that there are too many subdivisions of a command, thus taking a great deal of the control out of the hands of the regimental, squadron and troop commanders; besides this, the formations are too loose for the battle field of the future where more than ever before celerity will be one of the great factors of success.

It is not understood how the commander of a regiment, squadron or troop is to know where the different squads are and what they are doing, at the same time the non-commissioned officers of a volunteer army of the present day could not be relied upon to control the men under trying circumstances, even if possessed of the requisite intelligence, for it is a well known fact that a great deal of the trouble in the regular army arises from the fact that the privates will not carry out the instructions of their non-commissioned officers. If this exists in the *regular army* in time of *peace*, what will occur in the *volunteer army* during *war*?

Either the tactics by which an army is drilled, disciplined or maneuvered, should be very simple and easily understood, which is not the case now, or the discipline should be more strict. If the tactical movements are loose, the discipline should be rigid, for it would never do for them both to be of a loose and careless nature, since under this latter condition all control over the men would be lost long before the final struggle commenced, no one could control their fire or the expenditure of ammunition, the supply of which under the most favorable conditions has become a serious problem.

It is a fact that cavalry in motion, particularly at the fast gaits, will almost invariably get careless and be inclined to "run wild."

which is perfectly natural, composed as cavalry should be of young men and young horses. Both very properly feel exhilarated by the rapid movement, but they should be under perfect control, or this exhilaration will be their ruin instead of their strength, for unless controlled both will be worn out to no purpose.

Under the present drill regulations it is difficult to imagine the scene a future battle-field will present after the extended order has been taken up and the lines ordered forward. All might be well in the advance should terminate successfully, but in case of a repulse how would this army of squads be rallied? The reserve could not be used to stop them, for it would be required to cover the retreat or to hold the enemy in check until the squads could be rallied. It is assumed that the cavalry is handled as it should be in large bodies, either on foot or mounted, and far in advance of the large mass of the army. Of course it might rally after the fight, but that would be too late.

The discipline of cavalry, to make it what it should be, must be very exacting. The value of cavalry depends upon the condition of its horses, and unless they are given the greatest care they soon run down; the only way to give them proper care is to require strict obedience from the men, which the new drill regulations discourages by their general looseness.

The tactics which should be compiled for the use of the armies of this country should be written with a view to their being used by the citizen soldiery, everything in them being made as practical and as simple as possible, for the American as a rule does not enter the volunteer army in time of war for love of the profession of arms. The life of the soldier is distasteful to him, but love of country and the desire to uphold its institutions are his incentives, and the quicker he is shown how to fight the better he will be pleased. The tactics which will apply to the Germans, the French or the Russians, will not apply to Americans. They will not submit to the instruction necessary to learn foreign tactics thoroughly, but prefer to learn them after war has been declared; so that, in order to reduce losses to a minimum while thus learning, it would seem essential to make the tactics very simple.

Such maneuvers as are carried on in Europe, or anything approximating to them in magnitude, are not possible in this country in time of peace, for the people will not submit to it. The new drill regulations, to a certain extent, defeat themselves, for after a troop or company has been reduced much below its war strength there can be no drill in extended order without combining two or

more organizations as one. As the American will not submit to the discipline of European armies, from which the new drill regulations are evidently compiled, an effort should be made to prepare tactics based entirely upon what is best suited to our people, their temperament, physique and mental attributes, as well as our field of operations.

Foreign tactics do not apply to the American volunteer, or terrain, and no foreign army has yet defeated the Americans on their own ground, yet they have been opposed by the then finest troops in the world, the English, at a time when there was no military organization in America to speak of. It is very improbable that Americans will ever be required to fight outside of America.

During the last war, whenever the tactics did not provide for emergencies as they arose, the volunteer improvised tactics of his own, often very effective, and for this reason he would seem to some extent to be entitled to tactics purely American, and which can be applied at once to those who do not intend to become professional soldiers. It is not necessary to go out of America to find material from which American tactics may be compiled for the use of the volunteer soldier; tactics easily understood and admitting of great rapidity of movement; tactics to which should be applied a discipline peculiarly adapted to the genius and temperament of the free-men of America, a discipline to which they submit cheerfully when they see the necessity therefor, as is shown by the case of Colonel STREATOR and Private JAMS at Homestead, the latter of whom lost his case before the civil courts. If it had been shown in this trial that Colonel STREATOR had been governed by a spirit of martinetism, he would have been severely punished, but the volunteer soldiers of his command saw that such discipline was necessary at the time, and they supported him.

No troops object to a commander using his authority properly, but everyone objects to the abuse of authority, and the commander who does abuse his authority ceases to command in time of war quite suddenly. The old pipe clay and button stick martinet of half a century ago in the regular army never could handle the volunteer in the last war; he only excited ridicule.

There is more needless matter in the new drill regulations than would fill a small book, and, with a few additions and exceptions, the old book is better for the volunteer of America. Almost anything is better than European tactics, and it is not at all certain that the armies of Europe will use the tactics they now have, as many foreign military writers do not think they are effective, and are ad-

vocating a change. It does seem that the feasibility of covering the battle-field with a lot of squads, commanded by non-commissioned officers, might be questioned. If squads are to be used they should be larger and commanded by commissioned officers; make, for example, the platoon the squad. The tactics, at any rate for the volunteer, should be of such a nature as to produce the greatest efficiency in the shortest time, while the people are filled with the enthusiasm which would induce them to submit to a great deal of drilling and discipline. By the time the enthusiasm wanes, the troops would be in such a condition as to discipline and drill that the enthusiasm could, to a great extent, be dispensed with. Besides having a simple system of tactics, they should be compiled with a view to their adaptability to volunteers, not scientific military men, and should have for their object celerity of movement, not only on the battle-field, but all over the theater of war, for celerity must follow rapid fire.

It will be remembered that the soldier of Europe serves under entirely different conditions from the volunteer of America. The former is a soldier by compulsion; the latter enlists to serve his country in time of danger, because he chooses to do so. Necessarily, the tactics and discipline which govern the one will not apply to the other, therefore the volunteer soldier of America should be provided with a tactics and a discipline of his own, which, from his way of living and thinking, and from his being one of the governing class, must be very different from that which obtains in Europe—the American volunteer being a soldier from love of country, the European from compulsion.

The tactics which should be used in this country might be divided into three classes:

First. Those which teach the soldier to use his arms on foot and mounted; this would not require such a great amount of instruction, but when once learned they should be gone through with until the men acquire a certain amount of dexterity, the more the better, of course.

Second. Those movements should be taught which will bring the troops to the field of battle in the shortest time and to the best advantage; there are not many required.

Third. Movements which allow of the troops being handled in presence of the enemy with the greatest ease and celerity. The simpler these are the less liable they will be to cause confusion; they should be of such a nature that all officers exercising any con-

siderable command will comprehend what is intended by their common superior.

The present drill regulations seems to have for one of its objects the idea of seeing how many movements, or perhaps contortions would be a better word, a body of men can be put through; whereas, they should have been compiled with a view of obtaining the greatest simplicity. There are a great many movements and drills in them which will never be put into practice even in the regular army, and a volunteer command would never touch them.

Some of the movements which should be incorporated in the tactics to be used by volunteers, should be those which may be executed by troops on foot, infantry or cavalry, at the double time, or better still, at a run, for that is what will have to be done on the battle field of the future and on the march to it. It is easily seen what a power infantry so trained would be.

The writer of this article once saw a battalion of Mexican infantry just arriving at their camp, at sunset of a long June day, they having left camp that morning at daybreak and having marched sixty five miles, being on the road sixteen hours. It was my fortune to be with these troops during the last fifteen miles of their march, their officers were all mounted, the column was well closed up, and its rate of marching was a little slower than our double time, notwithstanding which the men were not as much distressed as ours would be after marching twenty miles. Of course they were not loaded like pack mules, although they carried their rifles and two belts of ammunition. Such troops it would be hard to out-manuever.

Americans can do this if properly trained for an emergency such as passing from one flank of an army to the other, or from the rear to the head of a column. To do it with ease the tactics should be simple and not calculated to harass, for there is nothing more irritating to volunteer troops, or to any others, when tired from marching long distances, or when under the excitement of battle, than to be continually directed to attend to trifling matters. The object should be to accomplish their mission as quickly as possible, and then rest.

The American volunteers will never make what Europeans consider disciplined troops, and at the same time European tactics and discipline will never be suited to America's citizen soldiers, the latter differing from their European neighbors in nearly every particular.

CONVERSATIONS ON CAVALRY: BY PRINCE KRAFT ZU HOHENLOHE-INGELFINGEN.

TRANSLATED FROM THE GERMAN
BY LIEUTENANT CARL REICHMANN, NINTH INFANTRY, U. S. ARMY.

TENTH CONVERSATION. (MARCH 21, 1886) — OF THE PREPARATORY AIDS AND OF THE PREPARATION FOR THE TRAINING PROPER OF THE REMOUNTS.

H. Please tell me to-day what changes you would like to have made in the system of training remounts as now generally practiced.

S. I shall have to begin with what I deem objectionable in our present method.

H. As yet the cavalry has but one gospel to follow, and that is the riding instructions.

S. The riding instructions are the result of the most profound deliberations of the most experienced riders. But, as I stated once before, they are written for good riders and can be understood by them only. They find it a good guide. A defective rider, be he pupil or instructor, could not see it at all. The fact that this is the case is the root of many sins.

H. In what do these sins committed in remount riding consist?

S. An instructor, for instance, takes in hand the second part, and following its letter, goes through the lessons by the day and hour as laid down, without paying any attention whether or not there is any mutual understanding between horse and rider.

H. Yet the introduction, and I might almost say every line of the riding instructions, contain a warning against undue haste in the progression of the training.

S. Yet you may observe in most any riding squad, that side lessons for instance are being practiced, although the horses do not yet understand aids by thigh or rein; and almost throughout too little regard is paid to the state of the horse's strength. A horse which

still staggers unsteadily under the rider, which pulls heavily or fails to come up to the bit, which draws itself together timidly and stiffens when feeling the thigh, is as yet incapable of going side paces—it is not ripe for them. If they are nevertheless demanded, the inevitable consequences are refractoriness, faulty positions of the neck, shifting of parts of the body, faulty paces, in short, defects of all kinds, which even the most skillful rider hardly ever succeeds in eradicating. The many paces in our squadrons are the result of premature demands on the horses.

H. It is true, if the aids mentioned in the riding instructions pages 34 to 40, from switch to dumb jockey, were applied at once we would soon be bankrupt, and ruin the horse.

S. What you are laying down here as the extreme, applies in a less degree to any, even the smallest progression in the exercises. For what are aids? The conventional language of the rider to the horse. The young animal must learn to understand this language before it can yield obedience. It does not know from its own knowledge, for instance, that it is to go forward when feeling the thigh, that it is to go to the right or left when the right or left rein is pulled. It must be instructed in this language. This instruction in the language is accomplished by means of the preparatory aids.

H. The riding instructions allude to them on the first two pages of the second part and on pages 55 and 63, before treating of the training proper of the remounts.

S. These preparatory aids are alluded to and mentioned in the books on riding and in the riding instructions, but nowhere are they fully treated. For it is assumed as a matter of course, that for breaking and training, men are selected who are riders. The proper rider spirit makes them understand that at the beginning they must "work from the block," as the saying is, and that the crude horses are not able to understand the aids laid down in the regulations, and must be prepared for them by natural aids.

H. I should say the manner is distinctly laid down in the riding instructions how to accustom the horse to saddle and bridle, and how it is to be led by hand first without, and afterward with rider, by another on an old horse.

S. In comparison with what is there called the training proper of the remount, the instructions are very short, simply because the supposition is that the riding instructions will be studied by those only who know something about it. Now if any one falling short of this assumption reads the few (8-9) pages which in the introduction and in the chapter on the breaking of the remounts treat

of this subject, and then the more than 200 pages on the training proper, he might conceive the notion that he could not go through all of the task of training, if he should spend more than a few days on the preliminary lessons. He will begin the training proper much too soon and apply aids which the luckless animal is as yet unable to understand and by which it is fretted into obstinacy, and demand from it exercises of which, in view of its bodily development, it is not as yet capable. For we should never lose sight of the fact that, while undergoing their training the animals are still in the stage of development, the muscles are becoming firm, the sinews strong, and the bony frame is hardening. Whoever, disregarding this, begins the training proper too soon, will ruin the horse.

H. You mean it would be the same as though a gymnast were to ruin a child if he were to begin its training with the somersault.

S. Approximately so. Add to this that the rider who, by the preparatory aids, working "from the block," has learned to control the unbroken horse, is much better able to ride such a horse into some shape. Soon after the first few collisions with the enemy in war we receive a supply of unbroken horses. Now if we have no riders who by means of the preparatory aids can reduce them to some kind of obedience, we cannot use these horses at all.

H. You seem to include the greater part of the aids among the preparatory ones.

S. Only apparently so. An example will better show the difference. When for instance you want to turn an untrained and perhaps at the same time stiff-necked horse, to the right, you pull the right rein in the direction of the horse's right hip, leaving the left rein loose, until the horse yields to the pull and turns the forehand in the new direction. Now compare this aid with the one prescribed for turning a broken horse. With the screw-like motion of the inner hand toward the rider's outer shoulder, with the *supporting action* of the outer rein, you would simply make an unbroken horse obstreperous.

H. In his "Chance Ideas" (Zusammengewürfelte Gedanken) ROSENBERG derides the screw-like motion of the inner fist even with trained horses. He says no rider ever turns a horse with any but the outer rein.

S. Such utterances of an expert rider are as apt to be misunderstood by non-expert riders, as the riding instructions are too frequently misinterpreted by instructors not complete masters of their profession. That in turning the horse its nose is first given the right

position by means of the inner rein before the horse is pulled around with the other rein, is so much a matter of course to ROSENBERG, intimately familiar with the horse's nature as he is, that he does it without thinking, just as we masticate the meat before we swallow it, and that he does not think it at all necessary to speak of it. He presupposes it as a matter of course, as do the riding instructions in many cases. You may also read in BALLY'S work, how even the jockeys in the race, just before the turn pull the horse's nose inward, thus indicating that the turn is to be in that direction. Afterward they pull the horse around by the outer rein. Upon the pull of the right rein the horse naturally follows to the right, upon that of the left, to the left. It is for this reason that we begin with the curb and the divided reins. The turning with the curb, as taught later in accord with the regulations, is of a conventional nature.

H. Referring again to the turning by means of the preparatory aids, I would like to say, that it produces quite a different kind of turning movement from that executed by the broken horse.

S. That's just it. The hindhand lurches outward, because it has not as yet the faculty of bending. Of this failing of the croup the rider must take advantage, to make the horse acquainted with the aids of the thigh, for as soon as it shows a tendency to give way toward the outer side, in consequence of the pull of the rein, the tendency should be assisted by touching it with the inner thigh and the switch. The horse will thus rapidly learn to obey the pressure of the thigh since the pressure is exerted in the direction in which it is about to give way itself with the croup. Hence it will yield willingly and ready obedience, and learn the thigh aids playfully. Such simple manipulations produce an understanding between rider and horse, and render the latter willing to learn the regulation aids and the later lessons almost unconsciously, without coming in opposition to the rider. That this tends to save horseflesh is clear. The prescribed proceedings should at first be had at a walk and trot, for from the very beginning it should ever be kept in view to apply the lessons while riding forward, in order that the ultimate object, the riding, the gaining of ground to the front, may not be lost sight of. Avoid, by all means, the "kniebeln" and training backward. The riding should invariably be to the front. Any holding back at the beginning is an error. Whoever cannot sit the merry high jump of the young horse without pulling him down or losing his seat, has no place on a remount horse.

H. What you are saying of the aids by rein is also referred to in the riding instructions.

S. Very true! But it is merely alluded to because it is not part of the training proper mainly treated in the instructions, being merely preparatory thereto. Most riders and instructors allow themselves to be induced by the succeeding sentence to pass prematurely to the handling of the reins as prescribed in the first part of the riding instructions. This sentence reads: "If the horse gains in intelligence and obeys the rider's aids, the fists should more and more observe the prescribed position."

H. But the riding instructions constantly warn against too rapid a progress of the training, and especially so in the breaking of remounts.

S. You find this warning on every page, and yet it is this warning that is most frequently disregarded. Thus in the handling of the reins on raw horses. There the right hand should remain on the right side of the horse, the left on the left; the rider should keep his hands far apart and make long pulls. A pulling over to ward the other side of the horse, as in the bending of the horse after some progress has been made, should not be permitted on raw animals under any circumstances. The horse not being able to turn properly, the oblique pull will twist its head, the nose pointing inward, the ears outward. As already stated, the pull of the rein for turning should be in the direction of the horse's inner hip, under total disregard of the outer rein. The question is to give the horse's head the direction in which you want to ride. That much gained, you drive the horse forward and lead it between the two reins.

H. All remount riders insist that at first the hands should be held low. This is not mentioned in the riding instructions.

S. It is likewise one of the preparatory aids with which the instructions do not concern themselves. Of course the position of the hands should be low as required, under some circumstances alongside the horse's shoulders. A high position of the hands frets the horse and interferes with the gait, especially in riding forward at a walk. A high position of the hands is therefore totally wrong.

H. The Silesian Hussar Regiment, No. 6, had the remounts during their entire first year ridden with blanket only in order to facilitate a low position of the rider's hands. The stirrups were attached to a surcingle constructed for this purpose and provided with a bridge to prevent sore backs.

S. I like that.

H. From the very beginning the horses went better. But in changing to the saddle some difficulties were encountered due to the ensuing higher position of the hand.

S. It would seem then that the horses should be ridden on the blanket with stirrups only as long as the lowest position of the hands is necessary. I cannot refrain, however, from inviting your attention to the fact that riding on the blanket fatigues the horse's spine more quickly, because on a well fitting saddle the burden is borne with less discomfort. At any rate a low position of the hands at the beginning is indispensable. This does not preclude that as an expedient both or one or the other may be raised. High position of the hands is frequently recommended to prevent buck jumps, which, however, has the very opposite result. When the horse does jump once, be it from its feeling good or inconvenienced, it cannot jump forward if the position of the hands is high; it can jump on the spot only, and must buck, which in turn gives rise to various bad habits.

H. This is entirely in accord with the method of my riding instructor LANGENS. Under his direction I rode a raw horse with a carp back, and a vehement bucker. As long as he bucked I was instructed to hold the reins low.

S. LANGENS was entirely right.

H. But it was rather difficult to keep in the saddle.

S. The seat, it is true, is the *conditio sine qua non* for all riding. In the absence of the correct seat an independent, opportune action of the reins is impossible. I am constantly reverting to that, and would like to speak of it every five minutes. Hence, with a raw horse the natural, unconstrained seat is the first requisite of the rider. He should sit confidently, conform to the horse's motions, never interfere with or retard them. The better he conforms, the better the young animal will go forward, the less it will find cause for ill-humor and opposition.

H. It may be quite a long time before the change to the regulation method of the handling of the reins can take place.

S. It cannot take place until the horse understands the correct action of the reins. When, with reins held low and far apart, the horse has learned to go forward and, as very correctly stated in the riding instructions, begins to seek support from the hand, it is time to bring the hands closer together. The pull of the reins is regulated by the progress of the horse's understanding for the aids by rein, very gradually, however, rather more toward the middle of the rider and finally toward his outer breast. If the horse fails to respond to such a pull, it is a proof that it was premature, and the primitive method should be at once resumed. It should be kept in view that the reason why a horse should respond with a turn to the prescribed,

screw-like upward and backward pull from the hand in high position is because we have to hold the reins in the left and our arms in the right hand. It is not at all natural that when the right rein is pulled upward and backward, the horse should turn to the right and, at the same time, move forward. The regulation method of handling the reins is therefore merely a conventional language which the young animal has to be taught before it can understand it. It is for the same reason the Wendish or Polish recruit fails to comprehend and respond to the nicest and plainest phrases, but does everything correctly if you address him in his own language. Thus at the beginning the horse should be addressed in its own language, *i. e.* it should go in the direction given to its nose until it comprehends the conventional horse language. I cannot refrain from mentioning that the instructor should carefully avoid the use of turgid phrases and hippological terms hard to understand. Their use is but too frequent and calculated to increase the user's importance who in his own mind often does not know himself what he is saying, while the men instructed do not get clear ideas, and become confused and stupid. It entails heavy penalties.

H. Nor do the effects of the thigh aids differ from those of the reins. Nature does not prompt the horse to move forward when pressed from both sides. It would rather seek to avoid this squeezing by contracting itself.

S. The regulation forward-driving thigh aids are the last ones a horse would understand without instruction. They are part and parcel of the conventional horse language. Nature would rather prompt the horse to evade the thigh, and I explained to you above that the best way to teach a horse the thigh aids is in turning. The riding instructions prescribe the application of the thigh vertically along the girth or four fingers in rear of it, and prohibit it in front of the girth or in rear of the flanks. The latter must by all means be avoided. It is apt to prompt the horse to opposition and to kicking at the rider's thigh, particularly when tickled by the spurs. As the habit of kicking at the thigh is hard to break, anything that is apt to bring it on should be most carefully avoided. As a rule, especially with mares, it also brings on a habit of switching the tail an unsightly and disagreeable habit, which disturbs and frets the neighboring horses in racks. Thigh aids in front of the girth can not always be avoided with raw horses, and are often to be recommended.

H. This interdiction is in the first part of the riding instructions and therefore refers to recruits riding trained horses.

S. If the thigh aid is given in front of the girth in the direction of the shoulder, in such a way as though the rider wanted to tap the horse lightly in rear of the shoulder blade with the ball of the big toe, the horse would be more apt to infer that it is to go forward than when the thigh is applied at or close in rear of the girth.

H. The riding instructions recommend the thigh aid in the beginning in the shape of light taps.

S. That is right, and as long as the horses are led by hand by another rider, they should be led forward when the thigh aids are applied. In this way the horse will soon understand this language. Care should, however, be taken not to tickle the horse with the spurs, which is apt to occur unintentionally with bay bellies such as the remounts usually bring with them. Instead of gaining in position, the horses will draw in and kick as already mentioned, particularly mares in heat.

H. It would be a misconception of the spirit of the riding instructions were we to emphasize thigh aids to entirely raw remounts with the spur. You will not, however, be able to do entirely without some emphasis to the thigh aids, particularly with lazy horses. I mean the switch.

S. The switch is indispensable with any raw animal, and has found its place in the riding instructions. It acts as interpreter, so to speak. For as a colt the horse learned to obey the switch when being driven to the pasture or stable. It should be applied mainly to supplement the thigh aids, because then the horse will learn so much sooner to understand them. It should be neither too long nor too flexible; the stiffer and firmer it is, the surer you will strike the point aimed at and the touch will not produce a tickling sensation.

H. You cannot employ the switch for the sole purpose of supplementing the action of the thigh, as long as the spur is not to be employed to chastise the horse. You cannot get along without inflicting some punishment, though I am willing to admit that of ten chastisements administered to the horse by the rider, the latter should have been the recipient of nine.

S. Of course the switch is also to be used to punish the raw horse. For this very reason the rider should carefully practice the handling of the switch in order that he may not fret the horse with the reins, jerk them or make the horse timid. He should be able to wield the switch with equal skill with the right hand and with the left, upward or downward, without check in the handling of the reins, and to change it from one hand to the other without scaring

the horse. I cannot refrain from mentioning here the habit of many riders of carrying the switch under the left arm in order to make sure of a steady handling of the reins. But this is apt to make the left hand and arm stiff and awkward, which is essentially wrong with young horses. If the remount gives a jump, be it from meanness or because he is feeling his oats, the entire left side of the rider's body contracts and stiffens in order to hold on to the switch. The independent, unconstrained seat, which alone enables the rider to conform to the horse's motions, is interfered with and frequently changed into a one-sided constrained one. All riders with this habit strike you at once unfavorably by their one-sided seat. Contracting the left hip they pull up the left leg more or less, and incline to the right. This way of carrying the switch should therefore be suppressed on the part of remount riders.

H. I have often thought if it would not be advisable to use a dead weight in accustoming remounts to bear the burden of the rider. I never made the experiment myself, because I directed the riding of remounts during but one year, and that under the supervision of my chief, and could not, therefore, deviate from the method prescribed to me. Horses ticklish under the saddle are, with advantage, left to stand saddled in the stable under a dead weight before mounting them. Why not remounts likewise in order to accustom them to bearing the weight?

S. This idea is obvious, and I have made experiments in this direction. I have found, however, that the dead weight torments the horse much more than the living weight of the rider. Under a rider weighing 120 pounds a horse with weak back would bend with far less timidity than under a dead weight of forty pounds, especially when the rider possessed a soft and independent seat and conformed to the horse's motions. Besides, under a dead weight the horse merely learned to bear a burden, and not obedience to the rider. It was not long before I gave up the experiment.

H. The riding instructions, it is true, give explicit directions as to how to begin the breaking of the remounts while being led by riders on old horses, and how to prepare them for the training proper, and I believe these instructions are everywhere followed conscientiously. There was a time when the young remounts were entrusted for a whole year to the care of the first sergeant or an old non-commissioned officer. The officers did not concern themselves about them until they became "old remounts," and their training as such was taken in hand. The consequence was that many became worthless from the beginning, and the best time was lost dur-

ing which the young animal should have been rendered obedient and its development assisted. That is different now. The youngest remount receives now, everywhere, so far as my observation goes, the very best of care.

S. That may be one of the reasons why, in this particular, the correct principles do not prevail everywhere. To-day the course of the young remount is frequently prematurely hastened, to the detriment of its training and bodily development; frequently, also, the right way is not followed at the beginning.

H. Will you please state your objections in detail.

S. At the very beginning of the preparatory training of the raw remount, the first direction of the riding instructions is frequently violated. They describe, in unsurpassed manner, how the raw horse with natural gaits, when running free moves with a natural balance, which is lost under the burden; how under the rider the horse should be given an opportunity and be assisted in regaining its balance in natural gaits. Any interference with these natural gaits by thigh or rein is expressly prohibited at the beginning.

H. This, I should say, is the aim of all instructors in remount riding.

S. Do you ever see a remount squad ride otherwise, even while the remounts under the rider are led by hand by the side of an old horse, than with a distance of two horses' lengths on the riding square, which barely exceeds the size of the riding track? Only one of all the remounts can thus go a natural gait, for there are no two horses whose natural gaits in walk or trot have the same cadence. All the other horses must, therefore, either increase or decrease their natural gait; must therefore from the very beginning be interfered with by thigh and rein; not one is allowed to go its natural gait. The assumption of a natural gait becomes an illusion if the distances are to be kept in the square.

H. It is for this reason that the riding instructions prescribe that a gait be sought which will enable all the horses to keep up without pushing them.

S. They will be able to keep up after a fashion, but still it will not be the natural gait of each individual horse. Though it be possible to find a gait which represents the average of all the fourteen or fifteen remounts, still one-half will have to be held back, the other half pushed in order to preserve the distances. This evil becomes most noticeable at a walk. Here a horse will trip and take to pacing; there another will have to be held back every few mo-

ments, which limits the free action of the shoulders when the horse has naturally a free step.

H. At the first beginning of the training period the riding instructions do not require a strict observance of the distances, to avoid overmuch interference with the horses and their balance and gaits.

S. This is a remedy, it is true, but only a palliative one. Generally, in the end, all horses have to keep up, otherwise those of a more rapid gait crowd those in front, and the slower ones remain so far behind that they finally check the head of the whole squad.

H. LANGENN, my instructor, forbade any change of gait, and cautioned to regulate the distance by rounding off the corners or following their lines more closely.

S. This is a very wise caution, in which I concur, as soon as the remount training has so far progressed that they will at all ride into a corner. With raw horses you cannot ride into corners, still less follow their lines more closely. It requires a bending of the horse in a manner of which it is not as yet capable. It causes pain, and either induces obstinacy or hurts its development in the same way as the keeping of distances.

H. Yet the riding instructions lay down how the corners are to be passed with raw horses, that the observance of distances prepares horse and rider for the proper riding in ranks, and offers various advantages in the work on the horse, particularly inasmuch as the rider is compelled to use certain aids promptly to the desired degree, and repeatedly.

S. In order to utilize corners and distances for training purposes, a certain degree of training must have been reached. Any intelligent rider will tell you that. Besides, you seem to have overlooked that the riding instructions characterize the riding on the square in squads with distances as an evil for military riding, particularly with raw horses. This evil has to be put up with, and very many of the careful directions and cautions contained in the instructions, aim merely at avoiding or lessening the injurious consequences of this evil.

H. This caution should be carefully observed.

S. But they are superfluous if the riding with distances and the passing of corners can be dispensed with.

H. The riding instructions in the beginning prescribe in detail how to pass corners, even where the instructor should stand on the covered track as well as in the open.

S. But they do not prescribe that on the very first day an open

or covered track should be used, and that this "necessary evil," where it can be avoided, be lugged in by force as it were. We are touching a point here on which I lay great stress. The riding on the square (open or covered track) and with distances is generally begun prematurely with remounts, and overdone. We are aware of the great demands on the strength and patience of the young animal, already fully taxed with the bearing of the unfamiliar burden. It is much more correct to ride the remounts individually during the first few months after their arrival on the largest possible track, leading them first with old horses which conform in their gait to the natural gait of the young horse. The space cannot be too large, so as to require the fewest possible turns and allow of their being made as gradually as possible. In this way they stride more amply; it is only when they are going singly that they can go their natural gaits, seek and find the support of the reins in the natural gaits, and, without prejudice to their development and strength, learn to understand and obey the preparatory aids. During the first few months no more should be aimed at than a free and ample stride with long reins, and a lively trot. Nor does it do any harm if the horse gallop once in a while; nor should it then be held back under any circumstances. Accustomed by means of the preparatory aids to the application of thigh and switch, the horse is gradually, at the trot, driven up to the bit, and it will then while lightly bearing on the reins, strive more and more to keep on a straight line. When the remount riders and their horses have once progressed so far that the latter will and must go on a straight line at a lively, uniform stride and making a narrow trail, we can say that by far the greater part of the work is done.

H. How can a single instructor sufficiently supervise and instruct fifteen remount riders trotting around on a large track each by himself?

S. Probably not all will need strict supervision, if some of them have gone through the same work the year before. It is advisable to instruct a few non-commissioned officers particularly well fitted for riding, who, themselves mounted, caution the younger remount riders whenever their action is contrary to the instructions. The instructor himself should take them in hand one after the other. If it cannot be done otherwise, he should take the remounts to the track by details, until the squadron possesses a few experienced remount riders. He may also take one remount at a time, the others halting and practicing mounting and dismounting, and familiarizing themselves with the horses. As soon as he finds that this or

that remount rider understands him, he may let him go with an accompanying rider on an old horse, and later on leave him to himself altogether.

H. You seem to be a great opponent of riding tracks, open as well as covered, and more particularly of the riding on the square with distances.

S. We are using the riding on the square and with distances in order to prove the example. As a means of training, in which character it is ordinarily used, I abhor it. If, for instance, after a while, I assemble my remounts on the square and let them trot around a few times, it can be seen at once which horses must be taught an ampler stride, whose hindhand must be brought up more to the forehand, etc. There the instructor sees and the rider feels in what direction more must be accomplished. The horses, once thoroughly broken to individual riding, must be able to go with absolute correctness on the track in the squad with distances without having been trained in this formation.

H. Riding on the square is more easily taught.

S. And more easily superintended, and this is the reason why it is in such favor; in this way much training and mistraining is done, for we do not thus gain the obedience of the individual horse; it is a mere senseless coaching for the inspection, confusing the conceptions of riding and cavalry training. In the times of **FREDERICK THE GREAT** nothing was known of riding in squads with distances. It originated, it seems, in the Prussian cavalry toward the end of the last century from the custom of having the best riders on the best horses perform on certain days of the week at the giving out of the parole.

H. They were the parade hours mentioned by **MARWITZ**.

S. Analogous to the productions in the riding halls, these riders rode artistic figures, quadrilles, etc., in squads with distances, in keeping with the custom prevailing during the first ten years after the peace of Basle, of toying with cavalry rather than keeping in view the stern demands of war as observed by the Great King. Riding in closed squads soon found favor, especially with less talented riding instructors, because the horses learn with astonishing rapidity to go one in rear of the other and then show a certain degree of obedience and dirigibility through habit, even when the aids given are the very opposite to the correct ones.

H. There are horses which obey commands no matter what aid the rider may give.

S. Such training is not the proper one for the horse.

H. On the decennium of peace mentioned by you, there followed the decade from 1805 to 1815, so unfortunate for cavalry.

S. It consumed nearly all the riding instructors, which point we discussed on a former occasion. The few talented riding instructors who believed in riding in squads only, became now the recognized leaders. Add to this, that the cavalry had to be created anew, and on a large scale. The means employed became the training "*en bloc*" in the shape of riding in squads. The continuance of its existence is due alone to the long peace subsequent to 1815, for its only aim is the preparation, *i. e.* coaching, of man and horse for the inspections in the hall and on the track. When the horses were fat and shiny, the captains were lauded as splendid cavalymen. The historic origin of these productions on the square we discussed on a former occasion, but I must again revert to them to-day. No wonder that no one thought of war, but merely how to put sand in the eyes of the superiors at the inspections. I tell you there are to this day many cavalymen who have imbibed this system with their mother milk. They cannot free themselves from its doctrines; can no more imagine a cavalry without riding hall tricks and riding hall inspections, than training without distances in the squad. The latter, looked at in broad daylight, simply means to hitch the horse behind the wagon. A sound state of training of service horses does not consist in breaking them into poorly going school horses by constant practice on small squares with distances, but in teaching them a good carriage and ample, free paces, balance and obedience. The less artificial lessons and other means are resorted to for this purpose, the more correct will be the bearing of the horses.

H. You are advocating the continuation of the riding instructions as the standard. Are you not in opposition to the same in thus abhorring riding on the square with distances, for which the riding instructions contain not only the most detailed regulations and illustrations, but which they have in mind on every page in laying down commands and explaining their execution?

S. I am not conscious of the least opposition. The riding instructions refer to the riding on the square with distances as a necessary evil, hence I am in accord with them in my desire of avoiding this evil wherever possible. In every stage of the remount training the riding instructions enjoin the practice of individual riding to the fullest possible extent, hence I am in accord with them in demanding that individual riding be practiced almost exclusively whenever local and climatic circumstances permit, and that riding on the square be resorted to merely to "prove the example." The riding instructions

do not mention the square for the period of preparatory aids. The chapter on the "complete utilization of the time during which the remount is being ridden by the side of the old horse," does not mention it, and leaves it to the instructor how to utilize this time. They do not say in so many words that individual riding alone should be used, but you can read this desire in every line, for it is prescribed that the individuality of each horse be constantly kept in mind, which is impossible with the training "*en bloc*." Exact regulations for commands and their execution are ever necessary when several soldiers under one command are to do a thing, and hence when the weather consigns the remounts to the hall. On the contrary, in individual riding advice merely is given, instead of commands. Nor do I entirely disapprove of riding on the square. It should be resorted to in order to find out how this or that horse is to be corrected; in the further stage of the training it is to be resorted to at the time when the different paces are taught, in order to reach the uniformity of gait so necessary for cavalry horses, and lastly to prove the example in order to ascertain whether this has been gained. But while the horses are merely worked with preparatory aids, I would avoid any riding "*en bloc*," i. e., in the hall or square, as much as possible. The season in which the remounts come to the regiment (July or August), gives us the opportunity for it.

H. I am willing to drop my objections against beginning the training of remounts with individual riding only. Is there any other direction in which, in your opinion, the intentions of the riding instructions are, at present, not generally interpreted correctly in the beginning of the remount training?

S. They are interpreted correctly, but not obeyed, and this in two directions, closely allied. In the first place, the remounts are not spared sufficiently; in the second place, there is, as a rule, too much demanded of them at too early a date. Our remounts, as now obtained, are very good, but two-thirds of them are not more than three-and-one-half years old, half colts, still in a state of development, and must be spared.

H. It is an advantage that the troops receive the remount not as yet fully developed, and are thus enabled to accustom it gradually to obedience toward man, and exercise it properly during the development of its strength in order to shape the structure in a manner most favorable for use as a saddle horse.

S. This is certainly an advantage, but it should not be misused, otherwise the remount is ruined by too rapid a progress. Any premature training should be eschewed and only such light work re-

quired of the remount as will not impair its strength, weaken its back and legs, or interfere with its development.

H. It is true many an instructor and rider is misled by the good-natured willingness of the weak animal into teaching it too much, thus injuring the sinews and gait.

S. This is because the conceptions of how to spare a horse are not always clear. Every troop commander means to spare his remounts, but unfortunately he frequently does not spare them at all, because he cannot discriminate between what is good for the horse and what injurious.

H. Many mean to spare by giving the remounts days of rest.

S. Of that I will say nothing; it is strictly forbidden by the riding instructions. The riding instructor is sufficiently vexed every Monday morning with the spirit accumulated in the stable during Sunday, and I should prefer as a means of sparing the remount in the sense of the last quoted part of the riding instructions to give it proper exercise on Sunday if permitted to do so. Many a troop commander thinks he is sparing the remount by not trotting or galloping it. But with a large track, a straight line and with favorable soil, this is pleasant and beneficial to the remounts. He makes them go at a walk to a senseless degree. In that way the remount is too much held up and tormented with thigh and rein. One would think it would be easiest for the young horse to receive the rider's weight at a standstill and carry it at a walk. But this is not so. While the back is still weak it is most disagreeable to the young animal to receive the burden at a standstill, because felt most in that way. The burden makes itself felt almost equally so at a walk, less at a trot or gallop.

H. Many instructors probably have the remounts much ridden at a walk in order to work out a good, uniform stride.

S. That is exactly the wrong way. A good stride is the most difficult part of the training. The training must not begin with that. It should begin with what is easy. A sensible amount of trot here and there is the best kind of preparation for a good stride. It follows that at the beginning the remounts should not be tormented by having them stand still after the rider mounts, but should be given an opportunity to move off at once.

H. That is not practicable when you have to lead out with distances in order to ride in the square, for in that case the last ones become the most fretful because standing still longest. I have always attributed this to spirit accumulated in the stable and to the desire of moving forward.

S. Very well. But why has the horse a desire to move in spite of the heavy burden? Because it feels the weight less painfully in motion than at a halt; because it is borne and built to move, not to stand still. Nor should horses be allowed to move too long at a walk; they should shortly be made to trot; at a walk they should not be incommoded at all, but allowed to step out freely. If this is not done, obstinacy may easily be superinduced from weakness and pain, and the pace may be spoiled. The riders for the most part sin unconsciously in this direction by holding the reins too tight at a walk, from habit and absent-mindedness, in order not to lose control of the horse; they need the reins too much for confirming their own seat, and thus interfere with the stride. They hold fast instead of letting loose and driving forward. In this, and in the premature lessons in side paces, is to be found the reason why there are so many horses that do not go clean paces. The riding of side paces, among which I class riding with position, should be carefully avoided in the time of the preparatory aids. If ridden prematurely, they effect the very opposite of what is wanted. They delay the full efficiency of the horse for service, because relapses in the bodily development are sure to result from the strain prematurely put on. These relapses delay the time when the horse is in possession of its full strength, if it ever gets over the premature strain.

H. A kind of side pace lesson is the passing of corners where the horse must bend, no matter whether it be right or not. If you consider that in a hall with sides of fifty and twenty-five paces length, a horse must bend at the corner four times per minute at a walk and twelve times at a trot, it becomes clear that riding on open ground is less fatiguing than in the hall.

S. In a small hall the gait of the raw horse is spoiled at every corner. But the gait may also be spoiled on open ground, if you begin too early to hold back at a walk. In addition to the holding back, the driving forward, urging the horse on to the bit at a walk, is totally wrong in the first period of the training. It spoils the gait for good instead of regulating it. The pace is a stumbling block even for the most experienced, gentle rider; how much more for a remount rider with too hard a hand. The poor pace is not merely a defect of beauty. The pacer may be a good serviceable saddle horse, never a good cavalry mount. The moment he is to regulate his pace on the march by that of the other horses, he begins to rock, fatigues the rider and the latter is apt to gall the back, while on a horse that marches well and has a correct, brisk

gait, he remains fresh and rarely galls the back. I mention this with regard to the very beginning of the training. At this period the ultimate aim of producing the most efficient possible war material, must never be lost sight of. This implies in the first place the greatest possible marching power of the squadron, i. e., a correctly trained gait of each horse. The spoiling of the pace by pulling on the reins, by premature side paces, and all the faults formerly enumerated by me, also result from the fact that in the first weeks of his riding instruction feats were demanded from the remount rider by an ill-informed instructor, which require a certain degree of skill in riding. These things the remount rider has neither understood nor digested: they have taught him from the beginning to use the reins for confirming his seat. Thus are produced defects in seat and handling of the reins on the part of the recruit, and afterward in the remount's pace when entrusted to him later. All this results from the fact that the work of training the recruit was done with a view to the inspection; from the stencil work of coaching. Riders who control their horses with difficulty on the accustomed square and in the volts will not defeat the enemy; those with a confident, assured seat, and able to ride freely will do it.

But *en avant!*

H. I fear that for the beginning we are speaking too much of the walk just as faulty trainers cultivate it too much at the beginning. Let us rather speak of the trot, which is the means for inculcating the correct pace.

S. The trot is certainly the pace best calculated for training the horse and which should be used for this purpose. At the trot the horse drives forward and assists in bringing itself up to the bit. The trot should invariably be lively, thus preparing in time for the fast trot, which is indispensable for the thorough breaking of the horse. Then in the training proper any kind of trot must be ridden actively. The rider then endeavors to get the hind quarters to swing under, the fore quarters to come out high. It is excellent gymnastics for the horses, inculcating obedience and balance, two principal factors of the military mount. There is a sharp distinction between the trot used in breaking the horse and the one habitually used. The former cannot be ridden fast enough, while with the latter the question is to fatigue the horse as little as possible and yet gain ground.

H. Surely you would not require such a fast trot at the beginning of the remount's training.

S. Bless you, no. The young horse should not at first be urged

too much; it should be done gradually and in short lessons. In order not to be misunderstood, I ought to read to you twenty times those excellent portions of the riding instructions, where it is laid down how in the natural trot the horse should be allowed to seek the reins itself without feeling a sensible effect of the mouth-piece on the tongue. It is here where the greatest patience is necessary, that the gait be not decreased or increased until the horse understands the aid, and is able to obey it without detriment to its structure or development. Nor should the lessons in trot be too long at first, as is very properly emphasized in the riding instructions. After every lesson the young animals should be given the reins, and allowed full liberty on the track at a natural pace. Just observe how, after each lesson which has fatigued the horse, it will stretch its neck as soon as permitted. If it were not permitted to do so, the continuous pressure would cause pain, which renders the horse fretful, and incites it to be obstreperous.

H. LANGENN, the riding instructor so often referred to by me, used to familiarize the horses with rein and thigh, after they had conceived some meaning of this language, by slightly drawing the reins at the natural trot without using the thighs. When the horse was about to obey this aid, which was to be given very gently by moderating the pace, he would relax the reins gradually, and apply the thighs without the reins, and continue thus to alternate.

S. Care should be taken not to begin such work on the straight line until the horse at a natural pace has become as confident under the burden of the rider as it was in its free state without the rider. otherwise premature "knibeln" will interfere with the pace and spoil it.

H. LANGENN had the same thing done at a walk and halt. The quickest results from it I saw at a halt, by slightly drawing the reins and taking off the thigh. At first the horse would cringe back, giving the rider the feeling as though it was going to collapse behind. Then it would suddenly take the reins in a lubberly manner. If then these were gradually relaxed, and the horse was made much of, before replacing the thighs cautiously in their normal position, the horse would take the reins the next time with confidence.

S. I am rather averse to work at a halt with raw horses. Our remount riders are not sufficiently experienced to run the risk of making horses restive. For this reason I prefer not to give any lessons at a halt until the horse has attained a certain degree of obedience while in motion. Forward is the horse's element. For-

ward be the parole, and the watchword running throughout the entire training.

H. Then you would approve of the lesson referred to at a trot?

S. The gait can be increased and decreased at an early date without injuring the remount. It may even be a most beneficial lesson, promoting balance and obedience when the remount has become accustomed to the rider's weight in the natural trot. But the instructor, and the one working by himself, should take care not to mistake the "shortened trot" for the trot with diminished cadence.

H. The shortened trot belongs to a much further advanced period of training than the one of which we are speaking.

S. Certainly; yet, unfortunately, both are frequently mistaken for each other. Trot with diminished cadence should not be begun until the horse possesses its full strength, for correctly ridden it is exceedingly fatiguing. Faultily ridden, it is harmful like any other faultily taught lesson. To be beneficial it should be ridden very actively in very short cadence with little gain of ground, since it is intended that the horse should get the hind quarters well under and raise the front legs high. For this reason the horse can not do it correctly until thoroughly bent in the neck. It acts mainly on the bend of the haunches and free movement of the shoulders; is properly a school pace, and should be used with great care for purposes of campaign riding. It should never be seen in squads of any size. There are horses which, in consequence of defective build, will never be able to do it correctly, a proof of the great exertion demanded. Hence better results are generally attained by the shortened medium trot.

H. Then it does not properly belong to our subject of to-day, the preparation for the training.

S. We have to treat it negatively there, for the trot with diminished cadence is much abused, and much harm done by its incorrect execution. Instead of beginning it as stated, when the horses have the necessary strength and preparation, many squadrons begin it at once, and in endless repetition carry it so far as to kill all feeling and all inclination to move. It is demanded of young riders, recruits still struggling with their seat, who have neither feeling in their hand or seat, nor an idea of how to let themselves go when the horse under them is to go a lesson correctly. They make themselves as stiff and rigid as possible, and seek to gain by force and sheer strength what can only result from harmony between a soft, steady handling of the reins and gentle thigh aids. Instead of a correct short trot with high action and croup well pushed under,

you behold a shuffling, sluggish pace, with stiff shoulders, rigid back, high croup, misplaced neck and head. Instructor and rider deceive themselves. The former fails to see, the latter to feel, that the horse is slipping from the rider's control by pushing forward the lower jaw, and thus paralyzing all uncomfortable effects on the neck and body, for they are mistaking the shortened inactive motion forward for a correct, steady pace. Those only can ride and teach the shortened trot who know the feeling one has or should have, when riding the shortened trot on a correctly broken horse. This applies to all lessons of the training proper. Yet we frequently see lessons produced (for the mere sake of going through them) and inspected, which are far beyond the capability of horse and rider, and therefore incorrectly executed. They produce the very opposite of what the military mount needs most, pace and balance. Hence it is better to omit them where they cannot be correctly executed, and I repeat, the great majority of instructors and riders will attain better results with the medium trot, increased or decreased, than with the shortened trot.

H. Once to-day you mentioned the gallop of the raw horse. Would you let the young remounts gallop in the preparatory state of the training?

S. With regard to the gallop, there exists widespread wrong ideas. You will mostly, nay almost invariably, observe that rider and instructor consider it a capital crime when the horse once breaks from the trot into a gallop. Instead of driving such a horse forward to the reins and correcting it forward, the rider holds it back and attempts to correct it that way. This method is totally wrong under any circumstances, for it promotes the disobedience, or rather awkwardness of the horse, instead of removing it. When a horse bears correctly on the bit it must trot at the rider's will, for it must go the pace prescribed by him. What, then, may be the cause of the horse's breaking into gallop? 1. Its general weakness, inability to carry itself unaided; 2. Lack of obedience, *i. e.*, reluctance to go forward and feel the bit, meaning lack of confidence in the reins; 3. The horse's temper. The first case happens with particular frequency in riding in squads with distances. The horse cannot keep up, cannot control itself, and begins to gallop, especially at the corners. What harm is there in that? If driven forward by the rider on to the bit, which it should itself seek, and with which any sharp chuck should be carefully avoided, it will regain its balance, and settle back into a trot by itself. In the second case the rider only increases the horse's diffidence in the

reins by making their effect more keenly felt. For any reluctance to go forward the only remedy lies in driving forward, which circumstances may require to be done forcibly and energetically. In the third case the horse's anxiety lest it fall behind, and its impatience by holding back; hence again it should be driven forward. Frequently all three cases take place, the second predominating, and the horse becoming excited. Then it should be driven forward more than ever, without tormenting it with the reins. The motto of all military riding is "Forward."

H. These principles are no doubt adhered to by all intelligent instructors as the only proper ones. The dread of falling into a gallop and the anxiety of rapidly repassing into the trot, are principally due to the sharp reproof heaped on the rider of the broken horse in ranks for galloping instead of trotting, and thus causing unrest in front. What I would like to hear from you is whether you would like to see the gallop used purposely in the training of raw horses during the period of the preparatory aids.

S. Why not? It is entirely wrong to look upon the gallop as a gait requiring special preparation and presenting special difficulties. The horse likes it; you may see that by observing the colts on the pasture. The more blooded the young animal, the better it likes to gallop, the easier it finds this gait. There are horses to whom the gallop is naturally more pleasant and less fatiguing than the trot. Since in the training we should pass from the easy to the difficult, the gallop should preferably be used with such horses, to impart to them confidence in the reins.

H. There are some skilled riders who set up the principle that the trot should be developed from the gallop. The majority, however, proceed in the opposite way.

S. Both are right. It depends on the horses they are riding. The former, probably, have ridden none but blooded horses. The horse's nature should indicate which way to choose. There may also be horses which in the beginning should be ridden as much at a trot as at a gallop. Only, we should observe the same rules in galloping young horses as in trotting them, *i. e.*, we should be content at first when they go briskly forward at a free, natural gallop, suiting them. *Whether they gallop to the right or left makes no difference.*

H. That would about be the gallop which the trainer rides in training the two-year-old for the race.

S. Why should we not take the good wherever we find it? Of course the gallop contemplated here can only be a free, natural one, in ample space and on suitable soil. These obtaining, the gallop

can only be beneficial to the young remount. I presume, as a matter of course, that distances be not kept, that the gallop be not continued too long, that the rider really knows how to gallop, i. e., that he has a low and gentle seat, conforms to the motion, and does not need the reins for keeping his seat, though I am tempted to again lecture you on the seat in great detail, for if the rider stiffens himself he is apt to cause the animal more pain and injury in the gallop than in the trot. It is only when the horses have gained in strength and learned to work up to the bit at a gallop, head pointing straight to the front, that you may begin to require more of the hind quarters and pass on to a medium gallop. It is then that the training proper at a gallop begins. Riding the natural gallop in the squad, with distances, and in the hall, should be deferred for a long time, even when you begin to work the hindhand under the horse. The necessity of keeping distances and passing corners is apt to provoke rude aids, spoils the animal's delight in going, and injures its structure. A horse not as yet bent may be made lame by a single rude pull of the rein when passing a corner at the natural gallop.

H. Is there no danger of hurting the young animal by this trotting and galloping on large open riding tracks?

S. On the contrary; it saves the horse. Moving at will in natural gaits the horse is saved more than when, at a walk, it is forced through a corner every twenty-five or fifty paces; it must conform in this walk to that of the leader, and therefore is in constant conflict with the rider, and becomes excited.

H. Going the gallop, trot, walk, dismounting and leading by hand between times, how will you get along with the three-quarters of an hour or one hour allotted to remounts, when you are riding on a large track and unconsciously cover greater distances with each gait?

S. It is one of the advantages of riding on large riding tracks that you are not so limited in time as in the hall where you have to make room for another squad when the clock strikes.

H. Still the riding instructions prescribe that one hour daily should be the longest, three-quarters of an hour the shortest lesson of the remount.

S. You have failed to notice the subsequent sentence reading "which are worked in the hall." The free, natural gaits on the large riding track are not hall work. One hour in the squad with distances and uniformity of gait in the hall, at a walk and trot, is an enormous exertion for a raw horse, greater than three hours

of natural gaits in the open, singly or led from an old horse which conforms to the pace of the young animal. Such exercise in the open may make the horse tired and hungry. It will lie down in the stable and relish its food. Next day it may not be so full of spirit, but will have a lively gait. An hour of "kniebeln" in the hall may affect, though perhaps not tire it: it may get thick sinews and similar things, becomes excited over the conflict with the rider, perspires in the stable, looks around nervously and does not eat. Next day it still has spirit, mixed with obstinacy, and the resolution not again to put up with this tormenting. The fatigue and excitement then become greater and thus things go on until the horse declines. Many troop commanders then think they are saving the remount by prescribing more walk than gallop, or even giving days of rest for the horses to quiet down. But afterward they are only more spirited and obstreperous in the hall. Here we come back to what I said before, that many instructors do not know what saving the horses means. On the pasture the colts run around in the open all day and yet save themselves.

H. That is true. For work in the hall the riding instructions lay down one hour per day as the maximum. With much riding of this kind in the open the horses cannot help being healthier than when they merely exchange the air of the stable for that of the hall.

S. And this is the great advantage of the method proposed by me, which cannot be overestimated. I mentioned once before how sickness is averted by bringing the horses daily into the open air, and how disease is planted by confining them to the stable and hall.

H. The influence on the health of the remounts is also different when, during their absence, the stable is thoroughly aired for two or three hours, and when it can only be done for three-quarters of an hour while they are in the hall.

THE CAVALRY HORSE.*

HORSES for cavalry service are purchased under the contract system by the Quartermaster Department. The examination for soundness is conducted by professional veterinarians employed for the purpose. Only the horses which pass this examination are submitted to further scrutiny of officers detailed to duty in connection with the inspection and purchase under each contract. It will therefore be seen, that the knowledge required by the inspecting officers is such as will enable them to form a correct judgment concerning the adaptability of the animal for service, as shown by his conformation and breeding.

The duty is a very important one, and the care with which it is performed has a marked effect on the efficiency of the service. As surgeons occasionally err in accepting recruits, so mistakes must occur in judging horses; but the former are much more leniently regarded than the latter.

With proper care in the inspection and purchase of cavalry horses, sound and healthy animals are generally procurable. When young horses are received from farmers, and placed in warm city stables pending inspection, the change of air and surroundings is very apt to produce colds, influenza, or strangles. Particularly the last named trouble may exist in a latent form until the animal is shipped upon cars or boats, when the continual draughts to which they are exposed cause the rapid development of the trouble. Upon arrival at the distributing point or destination, the animals may be found in an unserviceable condition, although apparently well when inspected.

For the above reason, in time of active field service it is much better to buy horses not less than six to eight years of age. When only garrison service or moderate field work is expected, horses

* From advance sheets of "Horses, Saddles and Bridles," by Captain W. H. CARTER, Sixth Cavalry, U. S. Army.

from four to six years of age are preferable, for although more subject to disease, they can be more satisfactorily trained than old horses.

Every one does not judge a horse in the same manner, and the opinions of some are not as judicious or reliable as those of others. Those sometimes called upon to decide the good points or defects of horses may not be naturally endowed with the peculiar qualifications necessary for the solution of the problem. Those whose duty may require them to perform this work, may by intelligent observation, education, and experience, attain a satisfactory degree of proficiency, especially if possessed of natural aptitude, and not swayed by prejudice and fashion.

The faculty of judging implies not only attention, but a well balanced ability for comparison. The points of a horse are observed more quickly when he is brought beside an animal selected as a model.

The price usually paid by the government for horses is fixed by the lowest bidder. It is not, therefore, to be expected that ideal animals will be presented for inspection, but only such as the contractor can procure at a lower price than he himself receives. There will be a few first-class, many fair, and a superabundance of indifferent and mediocre horses presented. The government will be best served by rejecting all the latter.

The form of a horse determines to a great extent his fitness for service, and enables a fair prediction to be made as to his various qualities, provided he is sound. It requires judgment, much instruction, and long practice, to correctly estimate the relative value of various points, and to determine whether the good qualities counterbalance existing or probable defects. Some men seem able to see at a glance all the points of an animal, but conformation requires study, and those who have obtained practical knowledge only are not infrequently swayed by prejudice rather than controlled by sound judgment.

Good points in a horse are not mere matters of beauty, but shapes which, on mechanical principles, are likely to answer the required ends. However, shapes which may be objectionable for one class of work, are not necessarily so for another. Thus small "chunky" or pony-built horses are better for continuous work in the mountains, than larger and longer coupled horses.

While useless to search for perfection, it is well to study all the points of the ideal horse, in order to promptly recognize them when seen. The points taken together constitute the *form*, which must not be confounded with particular attitudes assumed by the horse,

for an animal whose conformation is perfectly adapted to service, will frequently assume such awkward positions while standing in a stall, or at the picket line, as to entirely deceive any but a well trained eye.

As soon as a horse is found which is a suitable model, he should be retained at hand for comparison, but contractors are entitled to a fair construction of their contracts. In other words, if the government pays only \$125.00 per animal, the contractor should not be expected to put in horses whose value is \$200.00.

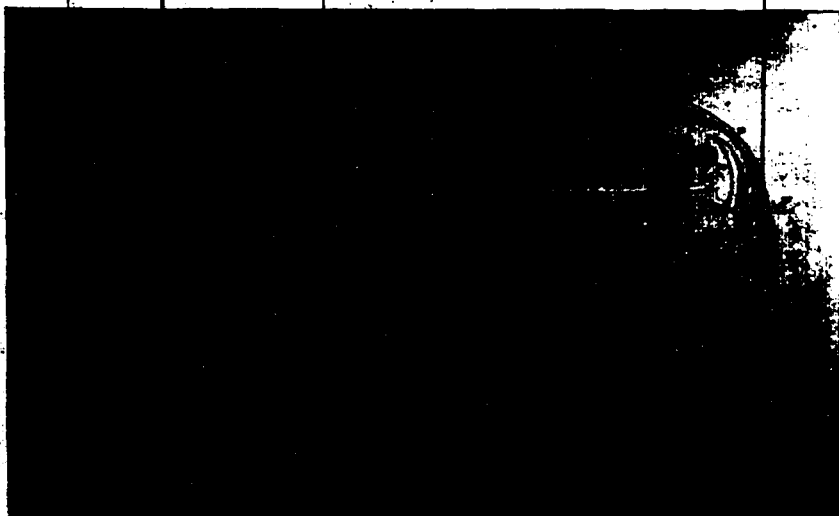
In conducting an examination of horses, he who possesses a perfect knowledge of the anatomy and physiology of the animal, will have a great advantage over one who does not.

It is absolutely necessary to know the names of the various parts of the horse, and it is presumed that those who read this book will wish to understand the construction of the skeleton and the superficial layers of muscles.

The nomenclature of these parts is given, as far as possible, in plain language, but some technical names are used because there are no popular names for the parts mentioned.

THE SKELETON OF THE HORSE.

PLATE I.



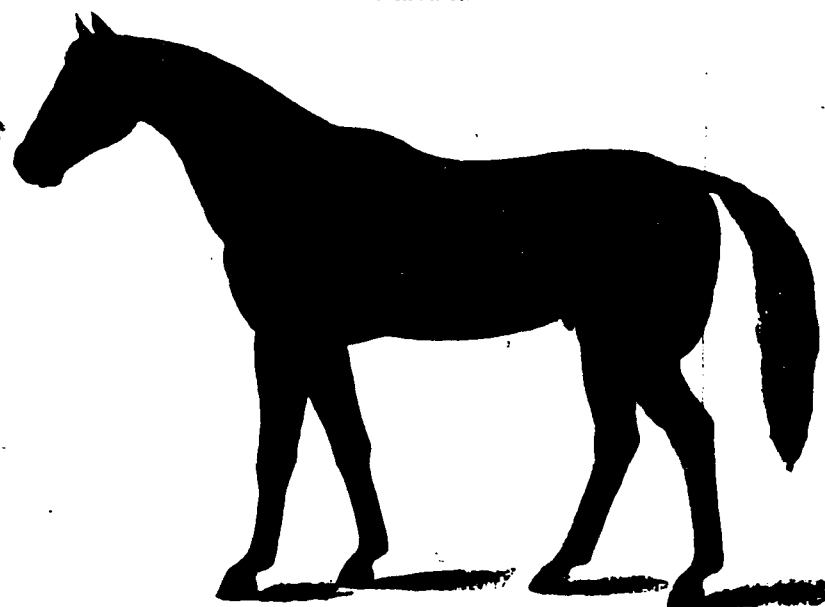
The animal here represented is the celebrated race-horse "Eclipse," pronounced by the highest veterinary authority to be

perfect. The form of the horse is indicated in outline. The nomenclature of the skeleton is as follows:

- | | | |
|----------------------------------|-----------------------------|------------------------------------|
| 1. Zygomatic arch. | 17. Upper end of arm bone. | 33. Sesamoid bone. |
| 2. Eye cavity. | 18. Arm bone or humerus. | 34. Small pastern bone. |
| 3. Face bones. | 19. Elbow bone. | 35. Upper end of leg bone. |
| 4. Incisor teeth. | 20. Cartilages of the ribs. | 36. Stifle joint. |
| 5. Molar teeth. | 21. Ribs. | 37. Leg bone or tibia. |
| 6. Lower jaw. | 22. Haunch. | 38. Point of hock. |
| 7. Atlas, 1st vertebra of neck. | 23. Haunch bone. | 39. Hock joint. |
| 8. Axis, 2d vertebra of neck. | 24. Great trochanter. | 40. Head of small metatarsal bone. |
| 9. Cervical vertebra (5). | 25. Small trochanter. | 41. Cannon or metatarsal bone. |
| 10. Spinal processes of back. | 26. Thigh bone. | 42. Coffin bone. |
| 11. Dorsal and lumbar vertebrae. | 27. Ischium. | 43. Fetlock joint. |
| 12. Sacrum. | 28. Radius or forearm bone. | 44. Patella, or stifle. |
| 13. Tail bones. | 29. Carpal or knee bones. | 45. Fibula. |
| 14. Shoulder blade. | 30. Trapezium. | |
| 15. Acromion process. | 31. Cannon bone. | |
| 16. Hollow of shoulder blade. | 32. Pastern bone. | |

SUPERIOR MUSCLES OF THE HORSE.

PLATE II.



The illustration (Plate II) shows the exterior muscles of the horse as they appear with the skin of the animal removed. Some of the deep seated and powerful locomotive muscles are not shown, and the one over the ribs is omitted.

The principal muscle for consideration in the plate is the long muscle, or system of muscles of the back. It fills the angular space on each side of the spinous processes, giving roundness to the back. It is very broad and thick over the loins, and in addition to

other connections, it is strongly attached to the hip bone. It is attached forward to all the spines of the vertebrae, as far as the neck, and to a strong tendon-like membrane that is firmly fastened to the same bones.

Special interest attaches to this muscle and tendon, because the saddle must rest upon it in such a way as not to interfere with the muscular action of the fore and hind quarters.

The names of the muscles are all of a technical character to indicate location, or action, and are omitted because knowledge of them is only necessary for a scientific study of the physiology of the horse.

NOMENCLATURE OF THE EXTERNAL REGIONS OF THE HORSE.

PLATE III.



The plate, copied from "Megnin," is numbered so as to locate by name the external regions of the horse. It is absolutely necessary to commit to memory this nomenclature in order to describe horses as well as to understand what is referred to by others when mentioning the parts.

1. Lips.	13. Neck.	27. Testicles.	41. Stifle.
2. Nose.	14. Jugular channel.	28. Shoulder and arm.	42. Buttock.
3. Face.	15. Chest.	29. Elbow.	43. Gaskin.
4. Forehead.	16. Withers.	30. Forearm.	44. Hock.
5. Eyebrows.	17. Back.	31. Chestnut.	45. Chestnut.
6. Forelock.	18. Ribs.	32. Knee.	46. Cannon or shank.
7. Ears.	19. Girth.	33. Cannon or shank.	47. Fetlock joint.
8. Lower jaw.	20. Loins.	34. Fetlock joint.	48. Fetlock.
9. Cheek.	21. Croup.	35. Pastern.	49. Pastern.
10. Nostril.	22. Tail.	36. Coronet.	50. Coronet.
11. Poll.	23. Dock.	37. Foot.	51. Foot.
11. Throat.	24. Flank.	38. Fetlock.	
12. Parotid gland.	25. Belly.	39. Haunch.	
	26. Sheath.	40. Thigh.	

If many horses are to be examined, copious notes should be retained by the officer for self-protection, and every horse passed should be branded with a number on the hoof for identification on the descriptive list, and also have the brand common to all public animals put on in the presence of the inspectors. Blemishes existing at the date of inspection should all be noted carefully on the descriptive lists.

It may happen at times that officers will be called upon to examine horses without the assistance of a veterinary surgeon. The "examination for soundness" and the chapter on the more common diseases and injuries will give the student sufficient knowledge to conduct fairly well the examination for soundness, provided he systematically applies the information contained therein to the cases available for his observation in service from day to day.

If unable to decide upon any question arising during the examination, the government should be given the benefit of the doubt. Such action will leave no cause for future regret.

It is seldom possible for inspecting officers to quietly view the animals in their stalls, before being presented for examination, because contractors are compelled to go over a great deal of country to collect such animals as in their opinion will be accepted by the government.

Contractors sometimes arrange to have a representative of the government accompany them when gathering horses, in order to avoid the heavy expense incurred by buying those which are sure to be subsequently thrown on their hands for various defects.

Whenever possible to see animals in their own stalls, it should be observed carefully if they kick or crib, which can be easily told by the appearance of the stall and manger.

If a horse points a toe, or shows other signs of weakness or lameness, it can be more easily discovered at this time than when crowded in public stables or sheds with large numbers of other horses.

Few of the stable vices can be cured, and unless horses are badly needed for immediate field service, animals known to have them should be rejected.

Some stable vices may be acquired from other horses, and it is therefore very desirable to avoid introducing into cavalry stables animals which may spoil others compelled to stand near them.

In addition to kicking and cribbing, which are about the worst habits a troop horse can have, may be mentioned weaving or the swaying motion so common to caged animals, wind sucking, continual pawing, pulling back when tied, and biting.

The wind sucker takes hold of the manger, picket line or halter strap, arches his neck and draws back with a grunting noise. The horse may be deterred temporarily from acting in this way by painting or smearing the objects in his vicinity, but he will resume the practice at the first opportunity.

Pulling back is very destructive of halters, and should be cured when possible by passing a piece of small and new hemp rope under the tail as a crupper, the rope being knotted on the back and the ends passed through the halter and tied to the manger, so that when the animal pulls back to break loose, the rope tightens and lacerates his tail. One or two applications of this rope crupper will in most cases affect a permanent cure.

The line of demarcation between blemishes and defects is sometimes very dim. Under the first named come all abnormal conditions of the various parts of the horse which do not affect his serviceability, such as scars, splints so placed as to be of no consequence, and similar things.

Under the head of defects come peg splints and those very close to the knees, ring bones, side bones, false quarter, quarter cracks, silfests, and any trouble, local or constitutional, which may tend to shorten or render unsatisfactory the service of the animal. These will all be treated in detail later for the guidance of the inspector, as well as with a view to amelioration and cure when they occur in animals already purchased.

Horses should be examined, if possible, in the open air. When this is not practicable, an open passageway or shed should be selected, where plenty of light may be had. When the horse is led out, he should be examined in profile from in front and behind, from the right and left, and obliquely forward and backward, careful attention being given to his temperament and attitudes in the meantime.

View the horse in all possible aspects, to determine the general harmony of his whole conformation. View the formation of the feet and legs separately and in pairs; the shape, expression and size of the head generally and in detail; the shape of the back and withers, with reference to carrying a saddle.

The examination should be made on unshod horses, but if any animal is presented shod, special attention is necessary to see if shoes have been put on for the purpose of correcting defects.

A good horse is one with many good, few indifferent, and no really bad points. One radically bad point neutralizes any number of good ones. Excess of power or development in one part of a horse may not only be useless, because the strength of the animal is limited by the weakest point, but it may be a positive source of evil. For example, a strong, powerful forehead is not an advantage if the hind quarters are light, because the strain on the hind legs will be unduly great. Similarly, if the fore legs are weak they may suffer from excessive propulsion communicated by powerful hind quarters, whilst they might have lasted a long time if all were proportionately developed. In a well formed horse there must be not only no weak point, but no part with excessive development, as compared to the others.

Outward forms are mainly dependent on the formation of the bony skeleton. In a well bred horse the tendons, ligaments and muscles are generally in keeping with the bones; that is, large bones usually give attachment to large, powerful muscles, tendons, etc. The processes of the bones are better developed, and give a greater mechanical advantage to the muscles than in the case of common country horses.

The power of a horse increases with his size, provided the relative proportion of the parts and the general compactness are maintained. This, however, is rarely the case. There is a certain size beyond which the parts do not seem to grow in due proportion to each other. Very large horses are seldom fit for saddle purposes.

Without good structural formation strength must not be expected, and even with it, do not expect all the desirable qualities.

There are some relations between parts of the horse which it is well to consider as an aid in training the eye. In this way it may be decided at a glance if a horse approaches the average form accepted as most suitable for service.

RELATIVE PROPORTIONS.

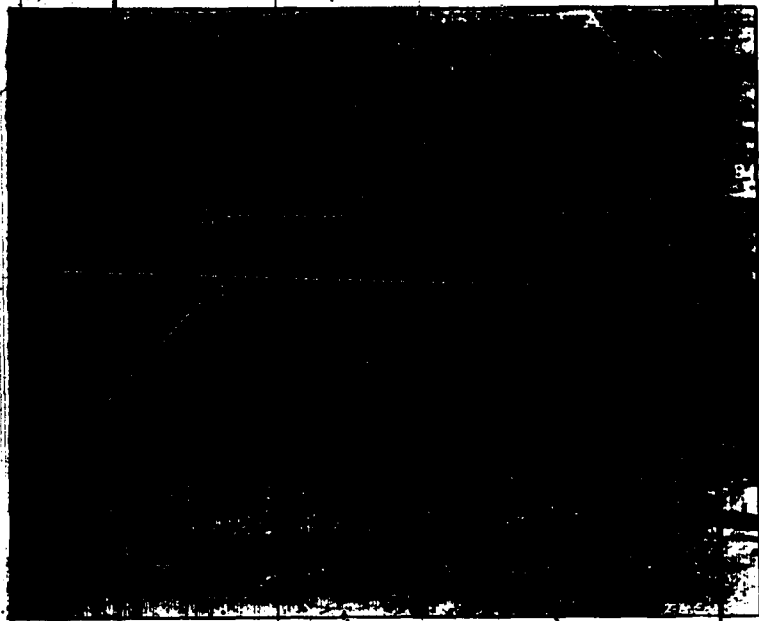
The horse shown in Plate IV was selected to be photographed because of his well earned reputation as an all-around cavalry horse and weight carrier.*

*The horse, "Deadwood," pictured in Plate IV, is thirteen years old, and has been in service since August 7, 1886. He is fifteen hands high, appears perfectly sound, moves at a walk, trot and gallop without any stiffness or peculiarities of gaits, and is a clean cut, strong and enduring cavalry horse. At the time this photograph was taken the horse was very fat. He was ridden by the orderly for the quartermaster of the Eighth Cavalry on the march.

The position is not constrained; it is the natural and free position assumed by the horse without assistance or interference. It will be observed that the frontal line of the head is nearly or quite parallel to the slope of the shoulders.

Now taking the head, measured from the poll to the extremity of the upper lip, as a unit, it will be found to enter as a factor quite accurately into several important measurements. The head should be measured as a shoemaker does the foot, and not with a tape-line.

PLATE IV.



This length of the head *AB* is almost exactly equal to the distance: 1. From the top of the withers to the point of the shoulder *CD*; 2. From the lowest point of the back to the abdomen *EF*; 3. From the point of the stifle to the point of the hock *IJ*; 4. From the point of the hock to the lower line of the hoof *JK*; 5. From the shoulder blade to the point of the haunch *LM*.

from Fort Davis, Texas, to Fort Meade, South Dakota, in 1887, a distance of about nineteen hundred miles. As the orderly accompanied the quartermaster in looking for camping ground, purchasing forage, and riding back and forth to the wagon train, it is a low estimate to place the distance covered by this animal at twenty-five hundred miles. He has done steady duty in field and garrison ever since, and he has undoubtedly been enabled to do this because his form is perfectly adapted to the weight-carrying requirements of cavalry service.

Two and one-half times the head gives: 1. The height of the withers *C* above the ground; 2. The height of the top of the croup above the ground; 3. Very nearly the length from point of the shoulder to point of buttock *DH*.

Do not expect every horse to fill these conditions, but remember that a small fraction of the length of the head added to his height or length, will at once give the animal an abnormal appearance. The length or height of a horse will seldom or never equal three head lengths.

If proportions are satisfactory, examine the muscles in a general way to form an estimate as to the probable endurance of the animal. Firm, dense, compact and clearly defined muscles are requisite for weight carriers.

The examination should next take a more detailed character, remembering always that although race horses may run and win in all forms, cavalry service demands a marked degree of uniformity, and the higher the grade of excellence secured the more economical and enduring will be the results.



Fig. 1.

Before proceeding with the examination, the age and height of the animal should be taken, to determine whether these come within the limits specified in each contract or letter of instructions. Perfection of form is usually found to a greater extent in horses under fifteen-and-a-half hands high than in those of greater height.

The Head.—When carefully observed, a great variation is seen to exist in the size and shape of the heads of horses. A wide forehead is nearly always accompanied by large nostrils, well situated eyes, ears small and widely separated, distance from the eye to the angle of the jaw great, large space under and between the jaws, head short and not of great volume. On the contrary, a narrow forehead is accompanied generally by small nostrils, eyes but partly open and appearing small, ears large and close together, and with but small space under and between the jaws.

The head first described is the one best adapted to the saddle

horse, for the second or coarse head acts like a heavy weight at the end of a long lever, bringing forward the center of gravity, and making the horse heavy in hand.

The nostrils should be large, and occupy nearly the whole of the lower part of the facial structure, because the horse breathes entirely through his nostrils, and not partially through his mouth as man does. The coarse horse has contracted nostrils with overlapping borders, and the entrances are beset with bristly hairs.

The mouth should be small, with thin, firm lips. The eyes should be large and mild, with fine eyelids. The ears should be delicate and pointed, and should move backward and forward with a quick, firm motion, without the least appearance of flabbiness. The eyes and ears indicate fairly well the temper of the horse.

Figures 1 and 2 represent two entirely different types of good heads. The first has the depression in the frontal line known as "dish-faced," and an unusual depth from the eye to the point of the jaw. The second is the head of a very fine saddle animal characterized by docility and intelligence, and perfection as to gaits.

The Neck.—The neck should be examined as to its form, length, carriage, and mode of attachment

to the head. The neck is called straight when its borders are rectilinear; arched, when its upper border is more or less convex throughout; ewe-necked, when its upper border is concave.

The long neck accords well with extreme speed, the short neck with power and the medium neck for all around saddle purposes, and in which class there is a wide range of intermediate forms. (Figs. 1, 2, and 3.) Very long necks are too mobile, while very short ones are not supple enough. Very long necks also have the disadvantage of over-weighting the forehand by bringing forward

the center of gravity. The volume of the neck should not be too large, but harmoniously proportioned to the other parts of the body.

The class of neck possessed by a horse is not altered by the addition of fat. A fine, silky mane characterizes well-bred horses; and coarse, long and stiff manes, common horses.

The Withers.—The withers comprise the region between the shoulders in front of the back, and in consequence of their prominence and anatomical complexity are exposed to wounds of variable gravity. As many of the muscles, ligaments and tendons which control the motion of the forehand are attached here, a considerable degree of elevation is necessary in order to afford good leverage, as

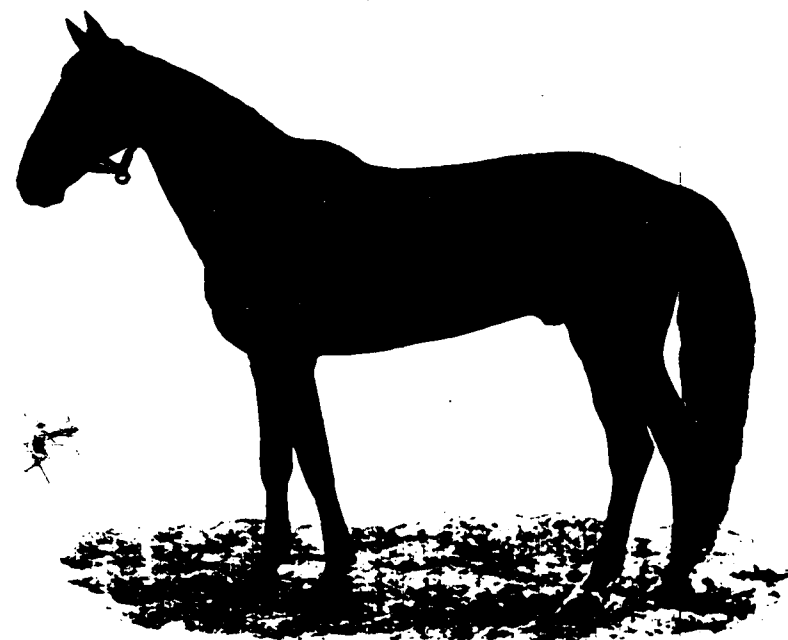


Fig. 3.

well as to give due length to the shoulder. Horses with very fine, high withers, while pleasant to ride, are unsuited for hard service with packed saddles. Elevated withers are usually accompanied by long, sloping shoulders and a rather deep chest. High, thin withers are usually accompanied by flat muscles about and in rear of the shoulder blade, where the front end of the side bars of military saddles are calculated to rest; this flatness allows the saddle to slip unduly forward, which is very objectionable. (Fig. 3).

Horses with low withers, not well defined or outlined, are not suited for heavy, packed saddles, because such a formation permits the saddle to slip forward and bruise the parts near the top of the shoulder blade, and this displacement also causes cincha sores close to the fore legs.

The Shoulder.—The shoulder should be sloping and comparatively long. (Plate IV.) If the shoulder blade is long, broad and

well sloped, the saddle will sit properly in its place; while if short and upright, the saddle will have a tendency to work forward on the withers. Upright or straight shoulders are very undesirable in saddle horses, although perfectly suitable for purposes of draught. Unequal thickness through the shoulders increases the weight of the fore-hand, and consequent wear on the fore legs, without any compensating advantages.

While all authorities agree that a sloping shoulder is essential in a good saddle horse, and many speak of it in an off-hand way, it will be found most puzzling to determine exactly how to class shoulders in fat horses.

In examining this part, it is proper to consider not only the portion occupied by the shoulder blade, but also the short bone (humerus) connecting the shoulder blade with the upper bone

of the leg. This short bone slopes backward and downward, and as the shoulder blade is better placed the more it slants, this short bone, on the contrary, is considered best when it slopes the least. It is the degree of slope of this short bone that causes the difference in the appearance in various horses as to the way the fore leg is set on; in some animals it seems to spring from the front line of the chest, and in others several inches back of that part. If the shoulder is very straight, and the horse be otherwise acceptable, the best plan

Fig. 4.

is to mount him; if he is, as he ought to be with such a shoulder, very rough, reject him.

The Back.—The back may be straight, convex or roach-backed, or concave or sway-backed. The straight back is a sign of strength, and with this conformation the saddle will rest in a good position. The roach-back, while strong, is unsightly, and contrary to free and rapid motion. The sway-back may be congenital or acquired, and

is the most faulty of all for saddle purposes, because the weight is almost entirely sustained by the ligaments, and the saddle is certain to bore into the muscles of the back.

Sometimes the line of the back is oblique from front to rear or rear to front. These forms entail an unequal distribution of the weight of the body upon the four extremities. The center of gravity is carried towards the fore limbs when the horse is higher behind than in front.

The back should not be over long. Short, straight backs are the strongest for weight carriers, but a certain amount of length is essential to much speed; moreover a horse with a very short back is apt to overreach.

The Ribs.—The ribs should have a well defined convexity from above to below. The curvature, taken with full

development of length, and definite separation from each other, constitute three desirable points of excellence. Flatness, shortness and nearness together are undesirable, because they limit the volume of the chest, and characterize the horse as short-winded and deficient in power.

The Chest.—The chest should have great capacity in depth without excessive width, and should be plump in front. Narrow-chested



Fig. 5.

horses lack endurance. The capacity of the lungs is marked by the size of the chest at the girth. While excessive width in front is not desirable for rapid gait, such form is well adapted to carrying great weight. The fore legs should spring from the chest perpendicularly as viewed from in front. Fig. 4 is a front view of the horse shown in Plate IV.

The Fore Leg.—The upper bone of the leg should be long in proportion to the lower or cannon bone. This bone cannot well be too large or too fully supplied with muscles. When the horse is examined in profile this bone should be vertical, and when viewed from in front, parallel to the median plane of the body. The knee should be wide from side to side, and thick from before to behind. The vertical direction of the upper bone, and cannon or lower bone, should be maintained at the knee. (Fig. 4.)

While a contrary condition may be congenital, and therefore not an unsoundness, since it does not interfere with firm and free movements, still a horse over in the knees, or knee sprung, is not desirable for service. (Fig. 5.) The opposite condition, known as "calf" or "buck" knees, is decidedly objectionable, owing to the undue strain brought on the ligaments and tendons.

The leg just below the knee should not be very small or "tied in," which indicates a weakness of the part, but should be as large as the other portions of the limb in that vicinity. (Fig. 6.)

The large or cannon bone, between the knee and fetlock, cannot be too short or too strong. It should be straight, as any deviation from a straight line is both a sign and cause of weakness. The fetlock, consisting of the upper and lower pastern bones, should be of moderate length. If the fetlocks are very long, they are necessarily weak, and there will be undue strain on the ligaments and tendons;



Fig. 6.

if they are short, the horse will be unpleasant to ride on account of the concussion to which the upright formation gives rise.

The feet should be of medium size, due regard being had to the size and shape of the horse, and there should be no visible difference in the feet as to size and form. They should be neither very upright nor too flat. The front feet being on the same line, the distance between them should generally be equal to the width of one foot from quarter to quarter.

The introduction of draught blood in many parts of the country has brought into the market a great many medium sized horses with large feet. Ordinarily a large foot is an indication that the horse has been reared on moist, soft pastures, and such feet are almost sure to deteriorate rapidly when put to service on hard roads at any but a slow gait.

Horses whose hoofs are naturally small and hard are better prepared to withstand the effects of warm, dry stables, or long marches over rough or dry country. They have less bulk and weight to lift at each step; their action under the saddle is more nimble and pleasant, and the pounding received by the feet is not so apt to be severe, because horses of this class usually travel close to the ground, while horses with large or flat feet generally lift their feet high. A contracted foot must not be mistaken for a naturally small foot.



Fig. 7.

Some horses toe in (Fig. 7) and some turn out their toes (Fig. 8). Both are objectionable in cavalry horses. Sometimes a horse toes in more with one foot than another, and breaks down first on the one which turns in most. The horse which turns out his toes is apt to "paddle" when in motion, and his hocks are likely to turn in too much.

The hind feet are usually more upright than the fore feet, and

are much less subject to disease, injury or mal-direction. The same remarks as to size and condition of the fore feet are applicable in general to the hind feet. If the toes show signs of striking the shoes of the front feet, producing in motion the sound called "clicking," the horse will not be satisfactory for marches at a trot under a heavy weight.

The Hind Quarters Generally.—The hips should not be ragged. High hips are not only unsightly, but are apt to be weak, for the reason that their prominence may be due to narrowness of the loins. The loins should be large, well arched, and fully furnished with muscle. The thighs should be deep and full, but with sufficient interval to prevent friction. The absence of muscular development known as "split up behind" is very objectionable. Fig. 9 is a rear view of the horse shown in Plate IV as a typical weight carrier.

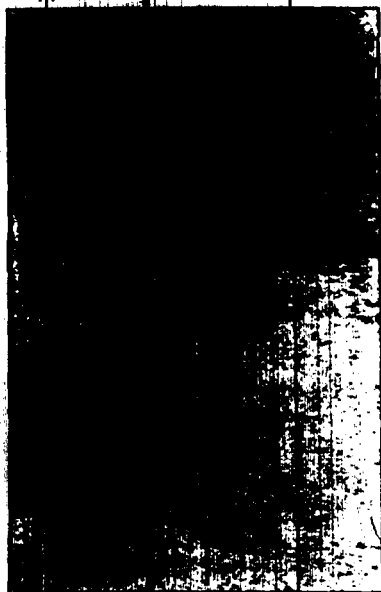


Fig. 8.

The hock should be neatly outlined, wide and thick. Large bones are usually accompanied by strong tendons and ligaments. The leg below the hock should incline but little if at all under the body; if inclined too much the liability to strain on the ligaments and tendons becomes great. If the leg below the hock is perpendicular, the conformation is favorable to speed, because the foot on arriving on the ground is strongly flexed upon the leg, which gives the hock energetic impulsion, and admits of long strides. If the lower part of the leg be inclined under the body, it not only affects the speed by diminishing the step, but increases the weight borne

by the hind quarters, and causes a considerable part of the muscular effort of impulsion to be expended in lifting the body, instead of carrying it directly forward.

The hocks should also be viewed from behind with reference to their parallelism to the median plane of the body. The hocks may turn towards one another behind, giving the horse the appearance called "knocked-kneed" in man, and "cow-hocked" in the horse. (Fig. 10). If the points of the hocks are turned out, the appearance is similar to bow legs in man. Both forms are objectionable for many reasons.

Doubts sometimes arise as to whether certain forms of curby hocks and spavins (Fig. 11) are really to be regarded as unsound; in all such cases the inspector should reject the animal for saddle purposes if the veterinarian does not feel justified in doing so.

The Tail.—The dock should be large and muscular. The tail should be carried firmly, and well away from the hind quarters. The tail is usually set on much higher and is more ornamental in well bred than under bred horses. The hair of the former is fine and scanty; in the latter it is frequently thick, coarse or curly. When the horse has considerable slope at the croup and his tail is set on low down he is characterized as "goose rumped."

The Body.—If from want of proper length and convexity of the ribs the circumference decreases rapidly from the forehand to the rear (Fig. 3), the cincha, and consequently the saddle, will slip back to such an extent as to necessitate breast straps. Such horses are very unsatisfactory, and no amount of good points compensates for this defective girth. This form does not possess an aptitude for retaining flesh under short rations and hard work, very essential qualifications in cavalry horses.

Upon completion of this examination, have the horse led at a walk on a hard road bed, and view his action from in front and be-



Fig. 9.

hind. Repeat this at a trot, viewed as before. Now have a saddle and bridle put on the horse, and note the disposition of the animal while this is being done. Have a rider mount and gallop the horse, so that he may be viewed as at walk and trot. It is usual at this time to have the horse galloped fast for several hundred yards to enable the veterinary surgeon to examine his respiration and wind.

The entire examination should be made without whips, noise or excitement of any kind. This is difficult to enforce at public stock yards and stables, but should be insisted upon.

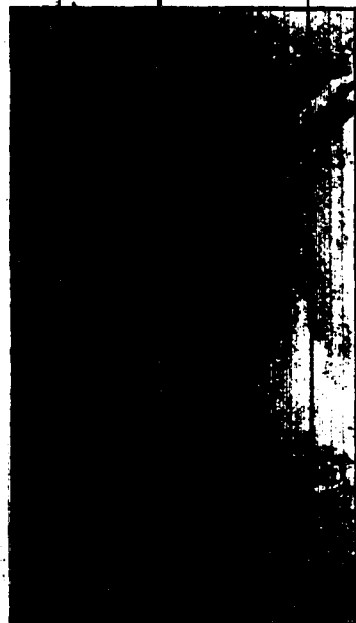


Fig. 10.

good condition without a load is apt to be worse when thin in flesh and fatigued from packing a heavy weight on the march. The "paddling" movement is not only unsightly, but occasions fatigue and an unnecessary waste of energy. Some horses, apparently sound and without vice or fault, will still be far from desirable cavalry horses. If, for instance, a horse appears clumsy and rough, especially at a trot, the inspector should mount him and give him a thorough trial, else he may pass into the ranks a rough animal whose harsh gaits will cause more discontent than he is worth.

In examining the horse in motion it should be observed if his movements at all gaits are regular, free and natural. The artificial gaits of the trained saddle horse are not only of no value to cavalry, but are an absolute disadvantage, for when animals with these gaits are ridden by guides it is impossible to regulate by them. It should be demanded that the horse walk, trot and gallop without defects or peculiarities of gaits.

If the horse is lame in the slightest degree, even from an apparently fresh and insignificant wound, the examination should not be continued.

If the horse throws his feet out of the vertical plane at a walk and trot—usually called "paddling"—or if he interferes sufficiently to cut himself, he should not be accepted.

A horse which interferes when in

Disappointment may come because an animal whose form justifies the highest expectations may prove without the courage or ability to perform according to nature's gifts, but there will be some satisfaction in the knowledge that those whose forms indicated unfitness have not been made a burden upon the government.

The principal points of the horse, affecting his adaptability for cavalry service, are all that it has been attempted to portray. A more complete theoretical knowledge may be obtained from many scientific books on the subject, but it is best not to overburden the memory at first. To apply theoretical knowledge, examine the same horse repeatedly and at intervals; seek opinions and advice of those who already have acquired practical knowledge.

In examining horses your attention will always be called to the fine points, of which most horses possess some. After the eye has become trained, a horse whose defects of detail predominate will at once show a want of harmony of the whole. If, on the other hand, his defects are few, the impression conveyed will be harmonious. It is then only necessary to determine if any of the defects of form are such as to be a source of weakness when the horse is put to the use for which he is to be brought.

It has been the main object in this chapter to give the young officer a knowledge of the various forms of horses, and of the relative value of different points. Something more is desirable, for it is not always practicable to have the professional assistance of a veterinarian. Cavalry officers and quartermasters especially should be able to make an examination of the horse for soundness without

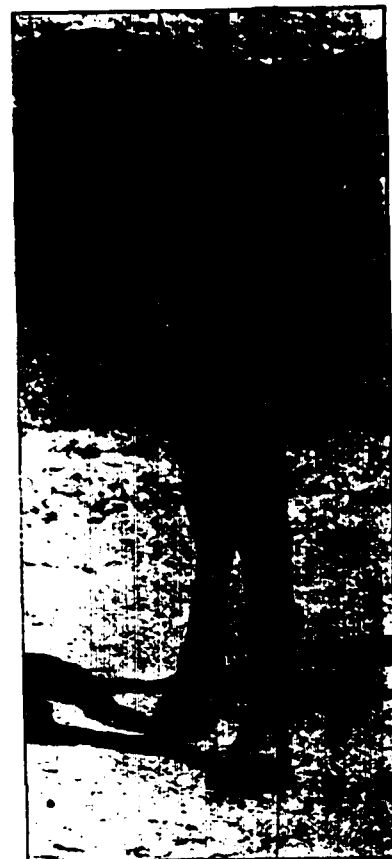


Fig. 11.

assistance, except as to certain occult forms of disease. The method prescribed herein is in accordance with the best practice of veterinary surgeons, and if closely followed will generally give satisfaction.

In all examinations of animals for public service, it should be kept in mind that endurance is limited by the weakest part, and that while in private life such care may be bestowed upon a horse as to cause a weak member to last as long as the more sound ones, this must not be expected in actual service.

EXAMINATION FOR SOUNDNESS.

1. Examine the animal as he stands in his stall to see if he points either fore foot, or favors any leg. Observe the position of



Fig. 12.

the posterior extremities when standing; move him from side to side and notice whether he steps upon his toe. Observe whether he cribs the wood work; holds on to the manger or halter ropes or straps to suck wind; bites or kicks; weaves; or whether he exhibits any glaring unsoundness forbidding further examination. Notice the pupils of the eyes.

2. Lead the animal out into the light, and observe if both pupils contract evenly; if not suspect defective vision. Stand in

front and compare the eyes, as to whether one is smaller than the other; whether there exist any signs of an operation having been performed; any signs of ophthalmia, white specks in the corner, torn eyelid, warts or other abnormal conditions. Wave the hand gently to and fro in front of the eye; if the animal does not instinctively close the eye upon the approach of the hand, proceed carefully to determine whether or not sight has been lost. Examine the ears for cuts and slits made by sticking the head into barbed wire fences. If the ears hang flabbily, or do not move quickly and rigidly at intervals, something is wrong; observe carefully the base of the ear and vicinity for canker. Look the horse squarely in the face to see if there is any abnormal development about the head.

Look for evidences of ulcerated teeth, as indicated by offensive odors, and swelling in the vicinity of the facial sinuses and of the bones of the lower jaw. Open the animal's mouth, and observe if all the teeth, molars as well as incisors, are intact. Examine carefully for parrot mouth, lacerated tongue, abscesses, bit bruises on the bars, and the teeth to determine age. Examine the nostrils for polypi, healthy color, ulcers indicating glanders, and for offensive discharges. Feel under the jaw for enlargement of the lymphatic gland. Examine the region of the parotid gland for evidences of inflammation, and also for fistula of its duct. Look for farcy buds on the neck and sides of the face. Raise the jugular vein to see if it is intact; observe if any inflammation of the vein exists. Pass the hand from the face down the neck to the withers for evidences of poll evil, bruises, or abscesses. Place the ear to the trachea, to observe if the sound of breathing is clear and even.

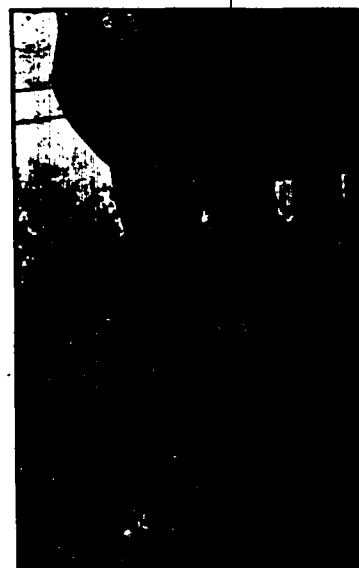


Fig. 13.

3. Pass to the left side of the animal and examine the withers for fistula (Fig. 12), and the back for sitfasts, or saddle sores. Observe the shoulder for signs of wasting away of the muscles, en-

largement of the joint, heat or tenderness. Feel the point of the elbow for capped elbow. Examine the near fore leg with the hand, looking at the off leg also for broken knees (Fig. 13), speedy cut, splints (Fig. 14), side bones, ring bones, brushing, sand cracks, seedy too, false quarter, scratches, grease, windgalls, heat about the fetlocks or coronet, and scars from wire fence wounds. Take up the foot and examine for indications of laminitis, contraction, quittor or flatness; to see if the bars have been cut away; whether there is any offensive odor of the frog, and to see if there is any peculiarity about the shoe, made necessary by the form of the foot, or the action



Fig. 14.

of the horse. See if there is any appreciable difference in the size or shape of the feet. Examine the tendons for evidences of sprains.

4. Listen to the heart to determine if its beats are regular. Observe the breathing to determine if the inspirations and expirations are equal. If inspiration is accomplished with one effort, and expiration with two, called "double breathing," the horse is unsound. This may be observed by watching the abdomen. Examine the abdomen for hernia. Pass the hand along under the chest and abdomen to feel for cincha sores and shoe bruises occasioned by a faulty method of lying down. Have an attendant hold up a fore foot while an examination is made of geldings to see if castration has been properly performed, and that no signs of scirrhus cord exists. Examine the

stifle joint, and pass the hand along down the near hind legs to the hocks, comparing at the same time the relative size of the hocks; examine for bone and bog spavin, thoroughpin, capped hock, curb (Figs. 11 and 15), and skin diseases in the hollow of the hocks (salenders). Examine the lower limb and foot as in the case of the fore leg, except that some injuries of the fore are never found in the hind leg. The inside of the thigh should be examined for farcy buds. Pass behind and compare the hips, quarters and buttocks: feel the tail, and observe the anus and vicinity for injury or disease.

5. Proceed to the off side and repeat such part of the examination as may be necessary for that side. Observe during the entire examination whether any parasites are attached to the skin.

6. Go to the horse's head, take hold of the bridle and back him suddenly; if the tail is elevated and the hind legs do not respond, or the animal should partially sit down, or elevate one of his limbs suddenly, he is unsound. Turn him around suddenly and look for the same symptoms. The horse should be led at a walk, and then at a trot, his action being carefully noted for any inequality of movement, which, if discovered, must be critically examined.

7. Saddle the horse and observe if he gives in the loins when mounted, or shows any signs of weakness or flinching. Have him ridden at a walk, trot or gallop, and watch for indications of lameness and peculiarities of motion. Have him galloped rapidly, up hill if practicable, and then have him halted suddenly; put the ear close to his nostrils, and listen to his respiration for roaring, whistling or broken wind, and also observe if respiration subsides promptly to normal or not.



Fig. 15.

Opinions vary as to whether grunting is an indication of unsoundness, and many practical horsemen believe this trouble changes into roaring. To be on the safe side, regard it as evidence of unsoundness. To detect it, strike the horse a sharp blow with a whip or stick, and make believe to strike again, when the horse will grunt if affected with the ailment. It may also be detected by halting suddenly from a rapid gait.

PROFESSIONAL NOTES.

Major C. C. C. CARR, who has edited the JOURNAL of the Association for the past four years, was recently compelled to relinquish his duties by reason of a change of station. The affairs of the Association have been conducted by him in a most harmonious manner, characterized at all times by moderation and a complete absence of friction. While an enthusiastic believer in the cavalry arm he has put down naught in malice or which could offend those whose choice or fortune has located them in other branches of the service. The gratitude of the Association is due to him for the labor performed in its interest, which has been done in moments of brief respite from pressing official duties.

[The following extracts are from "Notes on Places of Military Interest in the United States," by Captain J. F. MANIPOLD, R. A., which recently appeared in the *Journal of the Royal Artillery Institution*.]

"The stamp of horses to be found all through the States is most suitable for military purposes, those which I saw with the battery at Fort Hamilton, being particularly so. The purchasing of the remounts for this battery had been left entirely in the hands of the battery commanding officer and had been mostly bought from New York dealers, averaging from £36 to £38 each—a very high price to give in the States. These horses are, however, of an exceptionally good stamp, and few batteries in any army are better horsed than the one at present at Fort Hamilton.

"Anyone staying in Washington should not fail to go to Fort Myer. This post, as it is termed in the phraseology of the United States army, is about four miles from the city, and as a cavalry station is the second in importance in the United States. The electric railway can be taken as far as the bridge crossing the Potomac, and from there a wagonette can be hired to the Fort. All matters of interest will be shown, but, if possible, the men should be seen in the riding school. This building is one of the finest of its kind, being about 350 feet long by 120 wide; in fact it becomes a winter drill hall, and in wet weather is always used as such.

"The United States cavalry presents a different appearance from what we look for in a smart cavalry service; there is a complete

absence of any outward form of smartness, but at riding and all kinds of equitation work the men are very good; the riding bare-back and without reins is unsurpassed in any army, while the leaping of a high bar under the same conditions is a severe test of the training through which the men have passed. The horses are all thoroughly schooled; out of forty horses of a troop which was in the riding school at the time of my visit, every horse but one lay down on a given signal, and remained perfectly quiet on the ground till the signal to rise was given by the officer in charge of the ride. There is much to be seen in the stables and general management of the horses, and a great deal of practical knowledge is to be gained from the peculiarities of the saddlery and equipment."

ALUMINIUM HORSESHOES

It would appear from the trials of horseshoes at Fort Leavenworth during the past few months, that the plain aluminium shoes are the lightest of any horseshoes ever made, but they are not possessed of the necessary wearing qualities for hard service. Those with steel faces and tips, put on under great pressure, are much more serviceable than the plain aluminium shoes, but have the same fault of breaking apart easily. A light shoe is a much desired article for cavalry service, but if steel is to be pressed into the aluminium shoes to a sufficient extent to make them equal to the ordinary steel shoe in wearing qualities, it is a question if the lightness will not have disappeared almost entirely.

BOOK NOTICES AND EXCHANGES.

THE STORY OF THE CIVIL WAR: A Concise Account of the War in the United States of America, Between 1861 and 1865. By John Codman Ropes. Part I. G. P. Putnam's Sons, New York.

Mr. Ropes' book is both unique and valuable. The title, "The Story of the Civil War," is somewhat misleading, as it prepares the reader to expect a continuous and complete narrative of the causes and events of the war, which the book does not give; and the first impression on discovering that the entire question of slavery, with its heated controversies extending over the greater part of a century, is almost completely ignored, is one of distinct disappointment. But we are not long in perceiving that it is not part of the author's purpose to go into a discussion of the causes of the war, and that his ends are amply met by a succinct statement of the political beliefs entertained by the two contending sections—beliefs which constituted such radically different articles of political faith as to render all compromise practically impossible. The different theories of government and the different constructions placed upon the Constitution by the statesmen of the North and the South are set forth with that clear judicial spirit and eminent fairness which make Mr. Ropes one of the very best of American historians. No intelligent and fair-minded man can fail to approve the following statement of the different political opinions at the time when secession seemed to the Southern States the panacea for their real or fancied political ills:

"It was claimed by the advocates of the right of secession, that the United States was not a single nation, but a collection of nations, united for certain purposes and for the general convenience and profit, under an arrangement or treaty known as the Constitution of the United States. * * * If, then, the Constitution was a treaty between sovereign nations, it was plain that any one of the parties to it might in the exercise of its sovereign power, at any time withdraw from that treaty. * * * All this it is of the greatest importance to know, and continually to bear in mind, if we would understand the attitude of the Southern people during the war. They were not, in their own opinion, rebels at all; they were

defending their States—that is, the *nations* to which they conceived themselves to belong—from invasion and conquest. The character which this conviction of the Southern people gave to the contest was most noticeable; it is not too much to say that none of the usual features of a rebellion were to be perceived in the South during the war. There was, for instance, nothing in the temper of the South to suggest that the war was carried on for the redress of grievances—as is always the case among a rebellious population. On the contrary, the attitude of the South was from the beginning one of resistance to the uttermost; it was, in fine, the attitude of a nation repelling invasion, dismemberment, conquest. And, we repeat, it is of the first importance that we should recognize the grounds of this well-nigh universal feeling among the Southern people, if we would understand the cause of the unanimity and devotion with which they, for four long years, withstood the armies of the United States.

"The populations of the States which remained in the Union, though of many different minds during the winter of 1860 and 1861, were yet, after the war had fairly commenced, substantially agreed upon a policy of active interference. Without caring to dispute the truth of the contention that the original thirteen States were, when they adopted the Constitution, thirteen independent nations, the Northern people were very certain that in 1861 at any rate the United States constituted but one nation. They were not very clear as to the legal or political effect on a State of an ordinance of secession, but they were very clear indeed that the United States Government lost none of its jurisdiction by reason of such an act having passed a State legislature. The feeling that they were citizens of a great country, inheritors of a noble history, charged with the important task of preserving intact the great republic of the world, inspired the people of the North with a determination to maintain the integrity of the nation at any cost. * * * These differences were irreconcilable. The North could not admit the contention of the South. She denied the right of secession; in her view, the seceding States were States in insurrection. The parties were thus from the outset hopelessly at variance regarding the very terms of the controversy."

Beginning with this statement of the difference of opinion on the part of the North and South as to the United States being a *Bundesstaat* or a *Staatenbund*, the author proceeds to give an admirable sketch of the course of the movement of secession, first when South Carolina stood alone, and afterwards when the adherence of most of the other slave States created within our borders a great *de facto* nation independent of and hostile to the government of the United States. As a concise and clear statement of the events of this period, this portion of Mr. Ropes' work is unsurpassed.

The perplexing situation of Major Anderson in Fort Sumter is well described. The conduct of that officer is in the main commended, and justly approved; but, referring to a letter written by the commandant of Sumter to a personal friend, in which he defines

his "policy" in regard to keeping still, preserving peace, and giving time for the quieting of the excitement, the author says: "It is no part of the duty of a military man to have a policy, unless, of course, he is placed by his superiors in a position where he is expected to exercise the functions of government. Such was not the position of Major Anderson. He was simply holding an important military post. Of the effect on the country of an attack on that post, or of an attempt to furnish it with reinforcements or supplies it was clearly for the Government to judge, and not for him. * * * For all that he could tell, the Government might, for reasons of state policy, be desirous that the civil war, which was apparently inevitable, should begin at Fort Sumter. At any rate that was no affair of his; his duty was to furnish the Government with the information required of him; if he needed supplies or reinforcements either 'for his own safety or for a successful defense of the post,' to say so, and leave the decision whether to send them or not with those in whose hands lay the power and therefore the responsibility of sending or withholding them. It needs hardly to be said that the duty of an officer of the army to obey his orders is not in the least affected by the fact that the emergency with which he is confronted is a civil war and not a foreign war. This is wholly immaterial. So long as he holds his commission, the Government has a right to his obedience and his best services." This is pure military gospel; the only policy that should be held by a soldier consists of obedience to the orders of his lawful superiors and devotion to his country.

Mr. Ropes is of the opinion that the Confederates committed a great blunder in firing on Sumter. He says: "The civil war, then, was unquestionably begun by the Confederate States; and, it must be added, in a most unwise and inconsiderate manner. Far better for them would it have been if their authorities had taken Mr. Lincoln at his word and allowed provisions to be freely furnished to the little garrison of Sumter, and had then claimed the credit due to an act of considerate forbearance. Not a shot should have been fired. The return of the fleet, having landed the provisions only and brought back the troops, certainly could not have roused the patriotism of the North; it would rather, in all probability, have given occasion to severe though unjust attacks on the Government, for what would have been termed its weak and half-hearted policy. It would have been far wiser for the Confederate authorities to have waited until President Lincoln had undertaken some aggressive operation, or until he had so long delayed doing so, that the world would have said that he had, by his inaction, acquiesced in the establishment of the new nation." It is not clear that this view is altogether correct. So good an authority as Mr. Blaine can be quoted to the contrary. In "Twenty Years of Congress," we find the following: "Ever since the inauguration of Jefferson Davis, the flag of the United States had been flying over the strongest fortress in the Confederacy, and no forcible effort had been made to displace it. The first flush of joy and congratulation was over, and reaction had

begun throughout the revolting States. The Confederate Government was reminded by many of the leading newspapers of the South that unless some decisive steps were taken to assert its authority and establish its prestige, it would quietly crumble to pieces. The apparent non-resistance of Mr. Lincoln's administration had, in many minds, the effect of casting contempt upon the whole Southern movement; and the refusal to recognize or receive commissioners of Mr. Davis' appointment was regarded as a direct insult to their government, which, unless met by some decisive step, would subject the leaders to the derision of public opinion throughout the new Confederacy. Mr. Buchanan had been willing to receive commissioners from seceding States, so far as to confer with them, even when he declared that he had no power to take any action in the premises. Mr. Lincoln had advanced beyond the position of Mr. Buchanan when he refused even to give audience to representatives bearing the commission of the Confederate States. The situation therefore had become strained. The point had been reached where it was necessary to go forward or go backward; where the Confederacy must assert itself, or the experiment of secession be abandoned. From all quarters of the seven States came the demand upon the Montgomery government to do something decisive. A prominent member of the Alabama Legislature told Jefferson Davis that 'unless he sprinkled blood in the face of the Southern people they would be back in the old Union in less than ten days.' Public meetings were held to urge the government to action. The Confederate Government seems, then, to have been "between the devil and the deep sea." Action meant civil war; inaction meant dissolution. It can scarcely be blamed, under the circumstances, for having embraced the former alternative.

Mr. Ropes' desire to be just is nowhere more evident than in his comments on the action of the Southern officers who resigned from the national military and naval service and cast their lot with the South. Viewed from the standpoint of superior allegiance to the United States—a view now happily the one universally held by officers of the army and navy—the action of the Southern officers in this respect was unqualifiedly wrong. But, as Mr. Ropes clearly points out, the idea was then conscientiously entertained by nearly all Southern men that their allegiance was primarily due to their State; the question of a conflict between the Nation and the State had never arisen, and had never been considered in any oath of allegiance. It was purely a question of conscience and political belief. The purity of men's actions is to be judged from the honest opinions on which they are based; and such men as Robert E. Lee and Albert Sidney Johnston were doubtless actuated by the purest motives when they reluctantly, and with a sense of paramount duty, drew their swords against the Government which they had long and faithfully served. But while finding ample excuse for those officers who honestly believed that their allegiance was due to their State, Mr. Ropes is justly severe in his comments on men who, like "the venerable Edmund Ruffin" fired upon the American flag while

their State was still in the Union, or, like John C. Breckenridge, who, while serving in the Confederate army, were in arms against both their Nation and their State. Although Mr. Ropes mentions some of the illustrious Southerners who remained in the service of the United States, it is to be regretted that he did not mention the fact that while such Southern warriors as George H. Thomas, Farragut, Emory, Gibbon, Buford, French, and Hunter, remained true to the Union, we can find among the names of the Southern politicians only one—Andrew Johnson—who did not embrace the cause of the South.

It is impossible to agree fully with Mr. Ropes, or with Gen. Palfrey, whom he quotes, in the estimate of the relative aptitude of the Southern and the Northern people for war. Undoubtedly the greater familiarity of the Southerners with fire-arms, and the fact that they were, as an agricultural people, better horsemen than their Northern brethren, made them soldiers in less time than their opponents; but here the comparison must end. It is too much to say, as we might infer from Mr. Ropes' comments, that the Northern volunteer was actuated mainly by a sense of duty, while his opponent was inspired by a "pure love of fighting." The soldiers of Illinois did not differ in any appreciable manner from those of Virginia; and there was nothing to show in the long course of the war that Stannard's Vermont Brigade was composed of men essentially different from Hood's Texans. The same Anglo-Saxon groundwork was at the bottom of the military character of the soldiers of both sections, and any attempt to point out radical differences in the inspiration or method of their fighting must, from the very nature of things, be largely fanciful.

Mr. Ropes' comments on the military methods of Mr. Lincoln are interesting and sound, though they may incur the dissent of those who think that a great man can never be in the wrong nor display a want of wisdom. The superior sagacity of Mr. Davis in the selection of generals for high command is shown, though this was the one point—the only point—in which the Northern President failed to demonstrate his superiority over his opponent. Like most great men, Lincoln grew with his responsibilities, and became greater as his experience broadened. In 1861 he was entirely ignorant of military matters, while he was profoundly versed in the methods of the politician. He could keenly feel the pulse of popular sentiment, and appreciate at its correct value the influence of any political act; but he was as yet ignorant of the qualities requisite for the commander of an army, and it is sad to read of the manner in which he unconsciously prepared the way for disaster by assigning such untried civilians as Butler, Banks, and Fremont, to the command of independent armies. Politicians came to the front, while military men were either kept in subordinate commands, or were hampered by obstacles and interference caused by the all-potent popular clamor for impossible or injudicious military operations. It was not until Lincoln, as well as the rest of the Northern people, had been taught by hard experience the nature of war, that military

success became possible. Viewed from a military standpoint, the withdrawal of Blenker's division, consisting of 10,000 men, from McClellan, by whom they were urgently needed, and their assignment to Fremont merely that that unfortunate commander, who was in a department where he was practically unopposed by the enemy, might "have another chance," was a blunder so bewildering that it is almost impossible to find adequate words for its condemnation. Another astounding move of the President was his selection of a commander for the defenses of Washington. This position requiring not only a soldier of great general military merit, but one possessing also the technical knowledge of an engineer and artilleryman, should have been given to a man of known ability and military experience; but Mr. Lincoln assigned to this important command, General Wadsworth, a patriotic man of the highest character. It is true, but an untried civilian who was utterly ignorant of almost everything that a general in his position should have known. This remarkable appointment was made because it was deemed necessary for political reasons, to conciliate the agricultural interests of New York. McClellan's offer of Franklin, one of the most accomplished soldiers in the service, for this important command, was not considered. The insistence of the President upon a campaign in East Tennessee, shows at the same time his appreciation of the political effects of such a move and his inability to grasp its inherent military difficulties. But in this case he was supported by McClellan, who as Ropes says, seemed to regard everything as subsidiary to his own plans for a campaign in Virginia, and who seemed so to be unable to view anything in any other light than that afforded by its effects upon his own operations.

Mr. Ropes' estimate of McClellan is, like all his other reasoning, eminently fair. It has long been the custom to speak of that commander with undue admiration or with undeserved condemnation—generally according to the political complexion of the writer. History will probably adopt essentially the estimate of Mr. Ropes. McClellan was an accomplished soldier, a superb organizer, a true patriot, a man of unblemished character, and a general of very considerable military capacity; but he could not adapt himself to circumstances; he was wedded to his own plans; he could see nothing good or even possible in any other schemes; and he fell short of being a great commander.

It may not be too much to say that McClellan's fondness for his own plans, and his contempt for the suggestions offered by others were the primary causes of his failure. A military autocrat like Napoleon or the Czar Nicholas can conduct military operations undisturbed by popular demands, and untrammelled by unmilitary statesmen; and so, too, can a general like Von Moltke, who is supported by all the influence of a monarch, himself a military man. But an American general must be thoroughly in accord with the civil administration, and if he can not influence the civil commander-in-chief of the army and navy to adopt his views, he should make the best of matters as they stand, and either carry out as best

he may the plans imposed upon him, or give up a command which he cannot exercise in the way which his military knowledge shows to be necessary. It was not sufficient for McClellan to know that the transfer of his army to the "Urbana route" or to the Peninsula would in itself cause the abandonment of the Confederate batteries on the lower Potomac, and the evacuation of the intrenched camp at Manassas; it was not enough that he should himself feel sure that, with his own clutch upon the throat of the Confederate capital, no aggressive movement of importance would or could be made against Washington; he should have realized that the President, and above all the American people, did not understand the matter in this light, and he should, for his own safety, have respected their fears—or we may say their ignorance. As Mr. Ropes points out, McClellan could easily have sent a force to capture the batteries on the lower Potomac which were such a source of humiliation to the Administration, which saw the water way to the Capital blocked by Confederate artillery; and such an expedition would not have interfered with his greater plans, while it would have encouraged the people, and would have given a much-needed gleam of success to the somewhat gloomy military outlook. So, too, it was the plain duty of McClellan to see that Washington was amply garrisoned, because it was on that express condition that Mr. Lincoln had given his consent to the operations by way of the Peninsula. That it was not amply garrisoned, Mr. Ropes clearly shows; for McClellan's own estimate of the force required for the defense of the capital was 35,000 men, while he left for that purpose only 18,000 men, inclusive of the newly raised batteries under instruction. On this subject Mr. Ropes well says: "The truth was that McClellan was intent only on preparing a large army for the field. The equally important duty of providing an adequate and properly drilled garrison for the forts and lines of Washington was almost wholly neglected. Yet no one in the army was better qualified than McClellan to put Washington in a state of perfect readiness for any emergency. He unquestionably possessed the requisite skill and technical knowledge. Why, then, did he not do it, or seriously attempt to do it? Partly because he thought, or rather chose to think, that it was extremely improbable that works as formidable in appearance as were those which surrounded Washington would ever be attacked, and that therefore any sort of a garrison would suffice, but principally because he believed that the safety of Washington would be assured beyond serious question by the operations against Richmond which he proposed to conduct in person at the head of as large a force as he could possibly muster, and that, therefore, the more men he could take with him and the fewer he left behind, the more likely would he be to succeed, and the more 'secure' would Washington be."

"Had General McClellan been President of the United States he could have carried out these views with perfect propriety. But he was only a major-general in the army, and the orders under which he was now acting proceeded upon a wholly different theory from that which he himself entertained on this subject. His instructions,

contained in the order of March 8th, were to leave in and about Washington such a force as in his opinion and that of the corps commanders would leave the city entirely secure. This was reiterated in the order of March 13th. This done, and a sufficient force left at Manassas Junction, he was authorized to remove the remainder of the army down Chesapeake Bay."

The interference of the Administration with McClellan's plans made success well-nigh hopeless from the beginning, and it constitutes one of the saddest features of the entire war; but it might, perhaps, have been obviated, if McClellan's tact and knowledge of human nature had been equal to his patriotism and military attainments. In McClellan's place, Marlborough would have won the President over to his views by his infinite tact. Wellington would have made the best of the matter as he found it, and would have obeyed orders completely and without demur. Notwithstanding McClellan's great military knowledge, he certainly did not display a soldierly spirit in this matter.

Mr. Ropes' estimate of Stanton is concise, severe, and probably entirely correct. He says: "Stanton, who had been Attorney-General under Buchanan, was brought into Mr. Lincoln's cabinet as representing those Democrats who heartily supported the war; and he assuredly did not belie the expectations which the President had formed respecting him. Nothing could exceed his determination to push forward affairs at whatever cost; full of energy himself, he was intolerant of delay from whatever cause it might arise. Utterly ignorant of military matters; despising from the bottom of his soul what is known as military science; making no secret of his distrust of educated officers; rarely, if ever, lending an intelligent support to any general in the service; treating them all in the way in which the Committee of Public Safety treated the generals of the first French Republic; arrogant, impatient, irascible, Stanton was a terror and a marplot in the conduct of the war. Nothing justified his retention in the Administration but his magnificent, unflinching courage and confidence, qualities which, in a Cabinet presided over by Lincoln and containing Seward, rendered his presence at times well-nigh indispensable."

Of General Buell, Mr. Ropes says: "He was a thorough soldier; not even McClellan surpassed him in intimate knowledge of the various duties of officers and men, or in strength of conviction that prolonged and unremitting attention to those duties was the only means by which the volunteer regiments could ever acquire the solidity of an army. Buell was a strict—in fact, almost too strict—disciplinarian; but he was a great deal more than this; he sought to imbue his troops with the same principles of military duty which he held himself; his ideal of the soldier's character was of the highest; and the services which he rendered in this regard to the troops of his department,—afterwards known to the world as the Army of the Cumberland,—cannot be overestimated. Buell was also a very able man; in military sagacity, in clear and unprejudiced vision, in decision of character, he had few equals among the generals on either side."

It is interesting to note, as Mr. Ropes clearly shows, that the great forward movement which broke the center of the Confederate line by the capture of Forts Henry and Donelson, had its inception in the mind of Buell. Communicating his military ideas to Halleck, the latter "stole his thunder," and ordered the movement with his own command. It was a bit of retributive justice that the fame derived from the campaign thus inaugurated rests not with the ponderous-witted strategist who stole the idea from Buell, but with the taciturn brigadier-general who found in this movement the first round of the ladder of military success, by which he climbed to the final triumph of Appomattox.

A complete review of this excellent book would far exceed the space at our command. It is not a history in the sense of being an exhaustive narrative; many events, such as the relief of Washington, the struggle in Missouri, etc., being passed over with the briefest mention, while the capture of New Orleans is disposed of in fourteen lines. But, as a clear and accurate account of the salient events of the great War of Secession, as a philosophic discussion of conditions, causes, and results, it is a history of the highest type, and it is, perhaps, not too much to say, that of the many books on the Civil War of 1861-65, Mr. Ropes' book is easily the best.

ARTHUR L. WAGNER.

ORGANIZATION AND TACTICS. By Captain Arthur L. Wagner, U. S. Army. B. Westerman & Co. 1895.

To make plain the necessity for such a book as this, we have only to consider the case of an officer entering the military career: as most men do, with no professional knowledge except what is found in drill books and the regulations. Such a one, if ambitious and anxious to succeed, will see at once that he has much to learn, and if he is denied the opportunity of learning in actual war, he will seek to remedy his defects by study, as the next best course. Not knowing where to begin, he will most likely begin at the wrong end, commencing where others leave off, and he will dive into books with high sounding titles, such as "Strategy," "Grand Tactics," "Operations of War," and the like. Many books will be read and much time will be wasted before the zealous searcher after military knowledge reaches the plane upon which all knowledge is based. Moreover, the most tedious books are often the best, and one might thus be discouraged at the start.

To-day the conquering Germans are preëminently the soldiers of the world, and until they are beaten they will continue to form the model for the armies of our time. But their experts in cavalry, in artillery, in infantry, in staff duty, have written in the most prolix and tiresome style. It is a mercy to turn from them to a book by an American officer, where the developments of modern warfare are given up to a recent date, with instructive examples from our own history.

The subject of organization is treated briefly in a chapter of about forty-two pages, giving the make-up of a modern army. The

tactical part takes up nearly the whole book. Cavalry, infantry and artillery are discussed at first in chapters giving a historical sketch of the changes in each, followed by chapters devoted to the use of each arm in attack and defense. A chapter entitled "The Three Arms Combined," closes the subject by a discussion of the modern battle.

"Organization and Tactics" gives the gist of what has been discussed, worked out and approved by the ablest soldiers during years that have produced more change in our art than in any other trade or calling. Its technical character is not so marked as to keep it from being easily understood by unprofessional readers. Those who are familiar with other books by Captain Wagner will probably need no assurance as to its literary quality. E. S.

MILITÄR WOCHEBLATT.

No. 88: Essays of Major von Wissmann (IV). Attack of African Fortifications. Volunteer Nurses for the German Army. The New French Drill Regulations. No. 89: Results of this Year's Levy of Recruits for the French Army. Lava of the Cossacks. No. 90: Essays of Major von Wissmann (V-a). Campaign Marches and Camp Service in Africa. Fight Against Witbooi. New Organization of the French Artillery. No. 91: Review of the Imperial Maneuvers of 1894. Essays of Major von Wissmann (V-b). Pursuit, Retreat and Defense in Africa. The New French Instructions for Ammunition Supply. Transformation of the Russian Konstantinow Infantry War School Into an Artillery School. No. 92: Essays of Major von Wissmann (VI). Field Pioneer Service in Africa. Scharnhorst's Army Reorganization and the Social Democracy. No. 93: Review of the Imperial Maneuvers of 1894 (continued). Essays of Major von Wissmann (VII-a). Training of the Colored Soldier. On General Tactics and Combination of the Arms. No. 94: Essays of Major von Wissmann (VII-b). Treatment of the Negro. Maneuver Reflections of an Artillerist. Results of French Horse Breeding in 1893. No. 95: Life and Work of General von Grolmann. On the Action of the Umpires in Regard to Field Artillery in the Maneuvers. No. 96: Battle of Beaune La Rolande; a Study. Essays of Major von Wissmann (VIII). Special Consideration for Officers on Duty in Our Colonies. No. 97: Life of Field Marshal Count von Gneisenau. The Great French Maneuvers. No. 99: Instruction in the Infantry. Essays of Major von Wissmann (X). Hunting in Africa.

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