THE AMERICAN ARMY

: : : IN : : :

THE WAR OF SECESSION.

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TRANSLATED BY
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PREFACE.

In the month of March, 1864, the French government sent me to America to observe the operations in the war of Secession. I had as my assistant Captain Gusman of the Artillery, whose industry and intelligence made my mission an easy one. I returned in January, 1865, and submitted to Marshal Randon a memoir containing the answers to the many questions of the programme which had been prescribed for me. This memoir was divided into four parts:

1. Causes and probable result of the war.

2. The American Army.

3. Description of the arms and munitions of war in use in the American Army.

4. Construction and manufacture of arms and munitions of war. Arsenals and private factories.

My excellent friend, Vigo Roussillon, then professor of military administration at the Staff School, obtained

the report from the War Office and was pleased to make it the basis of a book, which the public, at that time, received quite favorably.

Nothwithstanding this publication, and although, thanks to it, the greater part of the documents which the report contains are known to-day, it has been thought that, in the present circumstances, it would not be uninteresting to publish the second part in its original form.

This I now do, after having completed it by some new documents.

THE AMERICAN ARMY IN THE WAR OF SECESSION.

The President of the Republic is the Commander-in-Chief of the Army. All branches of the military service are under the jurisdiction of the Secretary of War. These different branches are:

The Infantry.
The Cavalry.
The Artillery.
The Engineers.
The Invalids or Veterans.
The Signal Corps, including the military telegraph.
The Adjutant General's Department, including the Recruiting Service, the Bureau of Military Justice and the General Inspection.
The Medical Service.
The Military Academy at West Point.
The Ordnance Department.
The Quartermaster's Department.
The Subsistence Department.
The Pay Department.

The last four may be regarded as the supply departments of the army. The Ordnance Corps furnishes the arms, ammunition and all the enginery of war; the Quartermaster's Department supplies clothing, shelter and

transportation; the Subsistence Department, the provisions; the Pay Department, the pay.

THE REGULAR ARMY AND THE VOLUNTEER ARMY.

The American Army is divided into the regular army and the volunteer army.

The Regular Army.—The regular army is the army of the nation. It is recruited by voluntary enlistment with bounty.

The Volunteer Army.—The volunteer army is composed of troops furnished by the states for a specified time, on the requisition of the President, authorized by an Act of Congress.

This organization reminds one somewhat of the French army before 1789; it consisted of the royal troops, recruited by means of money, and the regiments drawn from the provincial militia raised by conscription in the parishes. It accords with the political constitution of the United States, formed as it is by a federation of sovereign states, each having its autonomy, but all joined in a Union, whose entity is manifest in a central government with its President, its ministers, its uniform money, its diplomatic service, and the sanction of laws for the general welfare, such as the customs, commercial treaties and political alliances.

The regular army is under the direction of the government at Washington; its recruitment, organization, military hierarchy, everything in fact being under the exclusive jurisdiction of the General Government.

The volunteer army, raised by the governors of the states, organized under the special laws and regulations of the several states, is brought into the service of the Na-

tion only after an incorporation at which preside special officers, called *mustering officers*. When these troops have been inspected and their officers examined, they are sworn in and only then do they form part of the army of the United States. They receive the national flag while preserving that of the State; thus while maintaining a national character they cannot be mistaken for troops of another State. Each volunteer regiment has thus two flags which it guards with equal fidelity, the flag of the State and that of the Union.

The militia of the States also form part of the military force of the United States. They are really National Guards and are not blended with the army. In case of insurrection or invasion, the President can call them into service for a specified time. Thus in 1832, General Jackson called out the militia of Tennessee to march against the nullifiers of the South. After the capture of Fort Sumter, in 1861, it was the militia of New York which occupied Washington for three months, constructed the fortifications and gave proof of great zeal and devotion.

Military Hierarchy.—The military hierarchy is the same for both armies. It is constituted as follows:

1. Lieutenant General.
2. Major General.
3. Brigadier General.
4. Colonel.
5. Lieutenant Colonel.
6. Major.
7. Captain.
8. First Lieutenant.
9. Second Lieutenant.
10. Cadet.
11. Sergeant-Major.
12. Quartermaster Sergeant.
13. Ordnance Sergeant and Hospital Steward.
14. First Sergeant.
15. Sergeant.
16. Corporal.
17. Private.

Down to the grade of cadet exclusively, the officers receive commissions; from that grade down, they have warrants only.

In the same grade, rank is decided according to the date of commission. An officer commissioned by the Union takes precedence over an officer commissioned by a State.

When troops of different corps are united, as in detachments for special service, the President may give to an officer the brevet rank which is necessary to enable him to take command. The assimilated rank which exists in all branches of the military service does not carry with it the right to command, except by a special order of the President.

Distinctive Marks of the Different Grades.—The distinctive marks of the grades are of two kinds, epaulettes and *straps*. Epaulettes are not worn in the field, straps alone are there used. These are a sort of epaulette about three centimetres in breadth. They are:

Blue for the Infantry.
Yellow for the Cavalry.
Red for the Artillery.
Black for the Engineers and Ordnance.
Violet for the Surgeons.

The Medical Cadets wear the straps without distinctive marks; the same is true of Second Lieutenants.

The First Lieutenants wear one gold bar embroidered at each end of the strap.

Captains, two bars.

Majors, a gold leaf embroidered at each end of the strap.

Lieutenant Colonels, similar leaves, but in silver.
Colonels, a gold eagle in the center.
Brigadier Generals, one star in the center.
Major Generals, two stars.
The Lieutenant General, three stars.

There is another very ingenious distictive mark of rank as follows:

The officers up to the grade of captain inclusive, have only a single row of buttons on the coat or overcoat. Majors, Lieutenant Colonels and Colonels have two rows of seven buttons with equal spaces between them. Brigadier Generals have two rows of six buttons, spaced two by two. Major Generals, two rows of nine buttons, spaced three by three.

All the officers wear a plain felt hat. The inferior officers wear on this hat a black cord terminating in two acorns, which are suspended in front of the brim. For field officers the cord is interwoven with gold lace; for general officers the cord is of gold.

Functions of the Different Grades.—The grade of Lieutenant General is held by only one officer; it is ordinarily given for life, and is conferred by the Senate. Old General Scott was retired from this grade at the beginning of the war, because of his great age. He had held it since the war with Mexico.

At the present time this grade is doubled. After the campaign of 1863, on the Mississippi, General Grant was invested by the Senate with the grade of General-in-chief. At the end of the war it was desired to reward the great services of Sherman, and Grant was accordingly given the title of General-in-chief and Sherman that of Lieutenant General. General Grant having been elected President of the Republic, Sherman was promoted to the rank of General-in-Chief, and Sheridan succeeded him as Lieutenant General.

The Major Generals and Brigadier Generals may be compared to our generals of division and brigade, with this difference, that it is not rare to see in the field a division commanded by a Brigadier General.

The Majors are the same as our *chefs de bataillon* or *chefs d'escadron.*

The cadets are the students at West Point and, by assimilated rank, the medical students employed in the medical service.

The quartermaster sergeant is a kind of *fourrier.* (Quartermaster.)

The ordnance sergeant is a non-commissioned officer, having special charge of the arms and ammunition.

The hospital steward is an administrative clerk, half apothecary, half nurse and familiar with all the operations of minor surgery.

THE OFFICERS.

In the regular army all the grades down to include that of cadet are filled by the President with the sanction of the Senate. The graduates of the military academy fill the vacancies as they occur; while awaiting vacancies, they are attached with a simple brevet to the different regiments, but in such a way that there may be only one brevet officer in each. Non-commissioned officers deemed in their regiments sufficiently instructed, are examined yearly at West Point, the first Monday in September. Those found proficient are attached in the same manner as cadets with the brevet of second lieutenant.

The Volunteer Army.—In the volunteer army appointments to the grades of major general and brigadier general are made by the President, always with the sanction of the Senate.

If the President appoints a general officer while Congress is not in session, that officer performs the duties of his new grade; but if his appointment is not confirmed by

the Senate at the following session, as it often happens, it becomes null and he returns to his former grade. All the other grades, from colonel down, in the volunteer army are filled by the governors of the different States. Here the rule ceases to be uniform. In certain States, in Massachusetts for example, the governor appoints the officers directly, after the troops are raised. In others, the officers appointed by the governor raise the different organizations themselves—the colonels, the regiments; the captains, the companies. In others, the officers are elected by the men; and finally, in most cases, a mixed system prevails, the governors appointing the field officers and leaving the grades of captain and lieutenant to election by the men.

Before being admitted to the army of the Union, all these officers have to pass an examination as to their capacity, before a commission appointed by the Secretary of War. The governors are required to replace those who are found unfit for their position.

Once commissioned, the officers are none the less subjected to a severe discipline, and if their manner of performing their duties leaves anything to be desired, it is not difficult to remove them.

The following table shows the number of officers who were obliged to return to their homes during the war:

ARMIES AND ARMS OF SERVICE.	DISCHARGED.				CASHIERED.	RESIGNED.
	With Honor.	With Dishonor.	For Incapacity.	Without Stated Reason.		
Regulars—						
Cavalry	1	....	1	25	1	97
Artillery	.....	...	.....	18	.....	50
Infantry	1	....	1	79	5	253
Total	2	....	2	122	6	400
Volunteers—						
Cavalry	1,775	12	330	394	38	3,055
Artillery	926	15	159	163	14	999
Infantry	8,104	159	2,569	1,586	200	17,036
Total	10,805	186	3.058	2,143	252	21,090
Colored Troops—						
Cavalry	36	....	.....	5	.....	34
Artillery	59	..	8	9	.....	68
Infantry	332	18	158	144	16	679
Total	427	18	166	158	16	781
Grand Total	11,234	204	3,226	2,423	274	22,271

The non-commissioned officers are appointed by the commander of the regiment or corps. They receive their warrants from the Adjutant General's office. The captain chooses from among them the first sergeant and ordnance sergeant. They can be reduced to the ranks by sentence of a court-martial, or, upon request of the captain, by an order from the regimental or corps commander. A sentence of reduction to the ranks is executed by a regimental order.

Every regiment has its chaplain. A chaplain must be an ordained minister of a recognized religion, with at least five years experience as such, and must be in good standing in his church.

Promotion, in both armies, is made by seniority; in the regiment, for the infantry, cavalry and artillery; in the corps, for the staff. General officers belong to the general staff of the army and are therefore not subject to these rules.

The officers of the volunteer army, when the troops to which they belong have completed their term of service, cease to hold office and are without rank or grade. Past service creates for them no right to hold office, but they continue to bear an honorary title of their grade.

Officers of the Regular Army Serving in the Volunteer Army.—The regular army lends its officers to the volunteer army. A lieutenant of a regiment of infantry, cavalry or artillery may be a colonel of volunteers; a captain may perhaps be a general. Holding this higher office does not vacate the lower grade, nor does it confer the right to a higher grade. Thus, one of the most brilliant generals of the army of the Potomac, Major General Hancock, commanding the Second Corps, was a quartermaster in the regular army with the rank of captain.

General Meade, commander-in-chief of the Army of the Potomac, when he won the celebrated battle of Gettysburg, where two armies, each 150,000 strong, decided the fate of the Union, held the grade of major general of volunteers; in the regular army he was only a captain in the corps of topographical engineers. The Senate, to reward him, upon the proposal of the President, conferred upon him the rank of brigadier general in the regular army. He was not promoted to the grade of major gen-

eral until a year later, after having continued in the chief command of the Army of the Potomac during the entire campaign of 1864.

In August, 1864, General Sheridan entered the Shenandoah Valley with an army which he commanded as major general of volunteers. He was then but a captain of infantry in the regular army. Three great victories gave him the grades of brigadier general and major general in the regular army.

Requirements for Promotion.—Although promotion is made by seniority, the right to it is not absolute. If an officer is declared unfit for the higher grade, he is not promoted; he has what might be called a negative choice. In certain special arms, the engineers or ordnance for example, fitness for promotion is determined by examination; if the candidate does not fulfill the required conditions, his promotion is deferred a year; after a second failure he is discharged.

Officers Serving Without Pay.—There are in the staff certain officers of the militia of the states serving as officers without pay. Colonel Lyman, aide-de-camp to General Meade, may be mentioned as an example. These officers, in every sense volunteers, have been noted for their intelligence, zeal and industry.

Brevet Officers.—Another purely American institution must be mentioned. The Senate gives as a reward to officers who have distinguished themselves, what are known as brevets of honor. These are honorary titles, the holders of which do not perform the duties of the corresponding offices. Thus a colonel may be a general by brevet, a captain may be a brevet colonel, yet they would remain colonel and captain respectively.

ORGANIZATION AND STRENGTH OF THE REGULAR ARMY.

Before the war, the regular army consisted of 1,098 officers and 15,304 men, distributed in small garrisons on the frontier. This effective strength was far from being complete; 371 officers and 1,374 men were not in active service. Now it does not reach the total of 20,000 men which an Act of Congress establishes as a maximum; and in compliance with a general order dated March 2, 1863, no new enlistments are made.

The regular army comprises:

GENERAL STAFF.

1 Lieutenant General.
5 Major Generals.
9 Brigadier Generals.

TROOPS.

19 Regiments of Infantry, each of 24 companies.
6 Regiments of Cavalry, each of 12 squadrons.
5 Regiments of Artillery, each of 12 batteries.

To which must be added:

The personnel of the Corps of Engineers.
The Signal Corps.
The Bureau of Military Justice.

The Medical Service.
The Ordnance Corps.
The Quartermaster's Department.
The Subsistence Department.
The Pay Department.

Each of these will be made the subject of separate notice.

The regiments are of fixed strength, maintained by enlistments, made at their depots. Their organization does not differ from that of the volunteer regiments, which we are about to consider.

The Artillery in the American army belongs to the line, not to the staff; the duty of supplying all its material has been taken away from it and devolves upon the Ordnance Corps.

ORGANIZATION AND STRENGTH OF THE VOLUNTEER ARMY.

GENERAL STAFF.

70 Major Generals.	26 Lieutenant Colonels.
275 Brigadier Generals.	45 Majors,
46 Colonels.	142 Captains.

The following figures are only approximate:

980 Regiments of Infantry.
223 Regiments of Cavalry.
30 Regiments and 127 Batteries of Artillery.
Companies of engineers, miners and pontoniers.

The regiments preserve their State designation, the 23rd Illinois, the 3rd New York Artillery, etc. Regiments are raised for three or nine months, one, two or three years, according to the requisition of the President. They are rarely organized with the full strength of a regiment and even then the organized strength is by no means kept complete, owing to rapid losses in the army.

When a new call for troops is made, new regiments are raised in the States; the old regiments, including the officers, being mustered out as soon as their terms of service expire. This is one of the causes of the inferiority of the American army. Jealousy of self-government by the States and the tendency of the governors to increase

the grades of which they have the disposal, have until now rendered useless the attempts of the central government to remedy this state of affairs.

Effective Strength.—The following are the orders of the Secretary of War, fixing the effective strength of the forces; it will be seen that the difficulty has been overcome as far as possible:

A general order dated April 29, 1863, prescribes the following:

Regiment of Infantry.—An infantry regiment has 10 companies.

STAFF OF THE REGIMENT.

1 Colonel.	1 Chaplain.
1 Lieutenant Colonel.	1 Sergeant Major.
1 Major.	1 Quartermaster Sergeant.
1 Adjutant, in charge of the rolls.	1 Commissary Sergeant.
1 Quartermaster.	1 Hospital Steward.
2 Assistant Surgeons.	2 Principal Musicians.

THE COMPANY.

1 Captain.	8 Corporals.
1 First Lieutenant.	2 Musicians.
1 Second Lieutenant.	1 Wagoner.
1 First Sergeant.	82 Privates, (maximum.)
4 Sergeants.	64 Privates, (minimum.)

Total strength of the regiment, 1,024 maximum, 844 minimum.

Regiment of Cavalry.—A cavalry regiment has 12 companies.

STAFF OF THE REGIMENT.

1 Colonel.
1 Lieutenant Colonel.
3 Majors.
1 Surgeon.
2 Assistant Surgeons.
1 Adjutant.
1 Quartermaster, (Lieutenant)
1 Commissary, (Lieutenant)
1 Chaplain.
1 Veterinary Surgeon.
1 Sergeant Major.
1 Quartermaster Sergeant.
1 Commissary Sergeant.
2 Hospital Stewards.
1 Saddler Sergeant.
1 Chief Trumpeter.

Total 20.

THE COMPANY.

1 Captain.
1 First Lieutenant.
1 Second Lieutenant.
1 First Sergeant.
1 Commissary Sergeant.
5 Sergeants.
8 Corporals.
2 Trumpeters.
2 Farriers and Blacksmiths.
1 Saddler.
1 Wagoner.
78 Privates; (maximum)
60 Privates, (minimum)

Total strength of a cavalry regiment, 1,244 maximum, 1,028 minimum.

Regiment of Artillery.—A regiment of artillery has 12 batteries.

STAFF OF THE REGIMENT.

1 Colonel.
1 Lieutenant Colonel.
3 Majors, (1 for 4 batteries)
1 Adjutant.
1 Quartermaster.
1 Surgeon.
2 Assistant Surgeons.
1 Chaplain.
1 Sergeant Major.
1 Quartermaster Sergeant.
1 Commissary Sergeant.
1 Hospital Steward.
2 Principal Musicians.

The Adjutant and Quartermaster are taken from among the lieutenants of the regiment. Total 15.

THE BATTERY.

1 Captain.	8 Corporals.
1 First Lieutenant.	2 Musicians.
1 Second Lieutenant.	2 Artificers.
1 First Sergeant.	1 Wagoner.
1 Quartermaster Sergeant.	122 Privates.
4 Sergeants.	

The artificer performs also the duties of a farrier.

To the foregoing strength the President may also add:

1 First Lieutenant.	2 Sergeants.
1 Second Lieutenant.	4 Corporals.

These are called Additional Officers.

The total strength of an artillery regiment is 1,743, or 1,839 with the additional officers.

In the volunteer army however, the formation of artillery regiments is exceptional. In most of the States the custom is to furnish only separate batteries. This custom is encouraged by the Secretary of War, as he is spared thereby the always useless regimental staff. Illinois, Missouri, New York, Ohio, Pennsylvania and Rhode Island are the only States which have furnished regiments of artillery.

In each State there are officers whose duty it is to furnish a sufficient number of recruits to keep the regiments up to their full strength, but in spite of this provision we have seen their numbers rapidly decrease. To avoid the maintenance of useless and costly regimental staffs and to induce colonels to be zealous in keeping their regiments at their full strength, depleted regiments are

consolidated, according to rules published in orders dated April 2nd and June 20th, 1863.

Consolidation of Regiments.—A company of infantry below its minimum strength loses its second lieutenant; the same is true of a company of cavalry. A battery must never have less than eighty-six privates, and when it is below its full strength, it loses its additional officers.

A regiment which is below the minimum, but has more than half of its full strength, loses:

In the infantry, the colonel and one assistant surgeon.

In the cavalry, the colonel, one major and one assistant surgeon.

In the artillery, the colonel, one major and one assistant surgeon, as soon as it falls below 1,044 men.

A second consolidation takes place when a regiment is reduced to half or less than half of its full strength. This causes in the infantry, the loss of the major; in the cavalry and artillery, the loss of two majors. In this case the men are formed into new companies or batteries with the full strength, and the officers dispensed with are placed on the unassigned list. The officers retained are of course the most capable; they are selected by the general commanding the division or army corps, under instructions from the general-in-chief. Every week, a statement is furnished the Adjutant General, showing the number of vacancies in each regiment; orders are then issued filling them from the unassigned list.

Numeration of Regiments and Companies.—In the numeration of regiments, the States are kept distinct; each State has its separate numeration. There is a 10th Pennsylvania infantry, a 10th New York infantry, a 10th Ohio infantry, etc. When the term of service of a regi-

ment has expired, the regiment that replaces it does not take the same number; it is given the number next following that of the last regiment furnished by the State. This rule is sometimes followed, even though peace has intervened; thus the first regiment of infantry furnished by the State of Illinois in 1861, was called the 7th Illinois infantry, taking the number next following the six regiments of volunteers sent from that State in the war with Mexico. Sometimes the same number is doubled; for example, the 2nd Pennsylvania heavy artillery regiment, because of the popularity of its colonel, or for some other reason, was recruited to a strength of 3,200 men. Two regiments were therefore formed, one of 1,200, the other of 2,000 men, with the same regimental number; but in this case, the latter regiment was know as the provisional regiment.

Companies are designated in each regiment by the letters of the alphabet, A, B, C, etc. When regiments are consolidated, the new companies take new letters, beginning always with A.

THE DIFFERENT ARMS.

INFANTRY.

Dress and Equipment.—The American troops have a single uniform, consisting of a dark blue blouse and trousers of a grayish blue, somewhat like the color of the uniform of French gendarme. The different arms are distinguished by the color of the braid, which, for the infantry, is blue. The footwear of the infantry soldier is sometimes shoes and leggins, sometimes boots. His head-dress is the forage cap or, more frequently, a plain black felt hat. The foot-soldier has a gray-blue overcoat, to be worn over the blouse. A flannel shirt is in general use and assists in keeping up the good health of the army.

The knapsack, made of black canvas, is very awkward looking, yet it does not seem to fatigue its wearer and holds more than ours. A haversack is also carried, slung over the shoulder. Two blankets, one woolen, the other rubber, and a shelter-tent half, complete the soldier's baggage.

The musket and bayonet are the only arms carried by the infantry. The musket is of the Springfield pattern; an excellent arm, leaving nothing to be desired. It is a muzzle-loading rifle, calibre 14.7 millimetres. (Calibre .58). All its parts, being made by machine, are exactly

identical; so that a sergeant, with a supply of spare parts, takes the place of an armorer in each regiment.

The cartridge is metallic.* By the use of a metallic cartridge, it is found that there is a great saving of ammunition, since it does not become damaged on the march or in wet bivouacs. Thousands of cartridges, after having been in the hands of troops, are, for various causes, returned to the arsenals; they are always found to be in good condition. The bullet is made by compression. The powder is of the same composition as that used in the English service. The total supply of ammunition is 150 rounds per man, of which the soldier usually carries 40, or in special cases 60.

No cartridge pouch is used, but a cartridge box is worn on the waist belt, to which the bayonet scabbard is also attached. This cartridge box has movable tin compartments and is quite handy; yet the soldier in action usually prefers to carry his cartridges in his trousers' pockets, or in a knotted handkerchief. In such cases the great advantage of a metallic cartridge makes itself felt.

Armament.—An idea of the equipment of the infantry soldier may be obtained from the following table, showing the weight carried by the soldier in the field. Eight days rations are usually carried, the meat rations for five days being driven on the hoof.

*This can not of course refer to the Springfield muzzle-loader, but to the converted breech-loaders and other breach-loading guns, using metallic cartridges.

WEIGHT CARRIED BY THE SOLDIER IN THE FIELD.

Coat,	2	pounds
Overcoat,	$5\frac{1}{4}$	"
Shelter-tent-half	$1\frac{3}{4}$	"
Blanket, woolen,	$5\frac{1}{4}$	"
Blanket, rubber,	$2\frac{3}{4}$	"
Equipments,	$1\frac{1}{2}$	"
Three days cooked rations, in the haversack,	$5\frac{3}{4}$	"
Five days bread and small stores, in the knapsack,	6	"
Musket,	10	"
Cartridges, 40 rounds,	4	"
Total,	$44\frac{1}{4}$	pounds

This total weight is equivalent to 20 kilograms, 71 grammes.

Ordinarily, especially in the summer, the weight of the coat and overcoat can be deducted. This reduces the total to thirty-seven pounds, or sixteen and eight-tenths kilos.

Sometimes the soldier carries twelve days rations. In this case, the weight of four days' bread and small stores must be added, causing an increase of four and one-half pounds, or two kilos. Nine days beef rations are in such cases driven on the hoof in rear of the column.

Many generals seem to think a weight of sixteen kilos too heavy. This would appear true if one may judge from the great number of knapsacks abandoned along the roads. In some cases, especially during the very hot weather, nearly twenty-five per cent are thus abandoned. It is true that the large pay of the American soldier and his wasteful nature make him careless of his effects, especially as he is quite expert in replacing them.

Still, it has been proposed that a rule be adopted, that, whenever a short campaign is intended or when a battle is likely to occur in the neighborhood of the trains, the baggage of the soldier be reduced; the knapsack and overcoat to be left with the train. The soldier would then carry his woolen blanket, rolled and slung over the left shoulder. Bread for three days and various small articles of clothing could be carried in the blanket roll. Three days cooked rations could also be carried in the haversack. By this method the weight carried would be reduced one-half. The total would then not exceed eight kilos.

Drill.—Our methods have been copied very exactly. It will be readily seen that the American troops having been continually in a state of war, can not in matters of drill be compared to European troops. Those organizations, however, which were drilled in the various forts and depots before joining the army, are well enough instructed.

Unfortunately, they have often, upon first going into battle, made unskillful attempts to utilize their instruction and have paid dearly for it. Their comrades, schooled only in actual war, have possessed a real advantage over them.

Instruction.—The military instruction of the American infantry may well be likened to that of our reserves after the second year of service in regiments. But in their unusual skill in the employment of fire, the American infantry is remarkable. Operating almost always in a country thickly covered with brushwood, they have acquired the habit of reserving their fire and of aiming. In each regiment, picked men are armed with carbines and make excellent skirmishers. These carbines are of various models; the one in greatest use being the Sharp's carbine, an English model, breech-loading, with the percussion cap

separate from the cartridge. Next comes the Spencer magazine carbine. The magazine is in the stock and contains eight cartridges which are successively brought up and placed in the barrel. Its calibre is 13.2 millimetres. (Calibre .52). It is a very heavy gun, hard to keep in order, and suitable only for select troops. In addition, it is doubtful if its advantages entirely offset its defects.

Skirmishers.—There are in some brigades, whole regiments of skirmishers, called *sharpshooters.* They fire very accurately, so that in both armies, the percentage of officers and general officers killed is considerable. At the battle of Spottsylvania, General Sedgwick, one of the best of the Union generals, was killed by a Confederate soldier who was perched in a tree, more than 700 metres distant.

Intrenchments.—Another distinctive quality of the infantry and of all American troops, is their remarkable aptitude in making use of the ground. At the beginning of the war it was difficult to make them work; but now that they understand the great necessity for cover in a country where surprise is always to be feared, they throw up intrenchments without waiting for the order. We have seen lines thrown up with rare skill by troops arriving during the night on the extreme left of the Army of the Potomac; the engineer officers had little work in rectifying them.

CAVALRY.

General Description of the Cavalry.—There were, in December, 1863, 223 regiments of cavalry. Nothing in Europe can give one an idea of the American cavalry, unless it be our dragoons. A foot-soldier can be improvised but a cavalryman requires a long course of instruction. At the beginning of the war, the Confederate cavalry, each member of which furnished his horse at his own ex-

pense, formed an aristocratic corps and possessed a marked advantage over the Federal cavalry. Now that the original Confederate organizations have been exhausted, and the Federal cavalry have made great progress, the latter always have the advantage in all encounters. There have been very few cavalry battles during the war. In most cases, the cavalry dismount and fight on foot like infantry. The American cavalry throw up intrenchments like the infantry and with equal skill. One of the finest earth-works that we have seen, was constructed by a regiment of cavalry.

Armament.—The cavalry soldier is armed with a sabre and a six-chambered revolver, which is carried in a holster that forms part of the waist-belt. A carbine is carried suspended from the saddle.

The sabre resembles that of our cavalry of the line; they are generally inferior to European arms. As regards the carbine, it may be described as a breech-loading rifle, varying in calibre from 13.2 to 13.7 millimetres; its model is far from being uniform, the best being perhaps the Burnside carbine.

Some cavalry corps have the Spencer magazine carbine, which we have mentioned in describing the armament of the infantry sharpshooters; but its defects are of greater importance with the cavalry than with those select troops. Its weight and great liability to get out of order, make it unsuitable for cavalry; lastly, its rapidity of fire excites the soldier and leads to waste of ammunition. An incident which occurred at the beginning of the war, brought it into great favor. A single squadron, surprised in the forest by a body of Confederates, was able, by its rapid fire, to deceive the enemy as to its real strength; causing them to retire in great haste, thinking they were opposed by superior numbers.

Clothing.—The uniform is the same as that described for the infantry, except the color of the braid, which is yellow. A cloak takes the place of the overcoat; boots are worn instead of shoes and leggings or half-boots.

Pack.—The use of the revolver has made the pistol holsters unnecessary. The cloak is rolled in front of the saddle; the valise, which is square and very large, is suspended from the saddle bows, behind the rider. The wallet hangs at the right side. No weight can be carried on the horse in addition to the prescribed loads, which for 8 or 12 days march, are the same as those heretofore mentioned for the infantry.

Harness, Saddle and Stirrups.—The saddle, called the McClellan, seems to fulfill all the requirements of an excellent military saddle. A saddle and bridle have been brought back to France and submitted to the Minister of War. The special features of this saddle are its wooden saddle bows and the stirrups, also of wood, covered with a sort of shoe made of leather. A piece of leather runs the entire length of the stirrup straps and protects the leg of the rider. This stirrup is adapted to both cold and hot weather; its use leaves nothing to be desired. After Sheridan's raid in Virginia, an expedition which lasted more than a month, all the unserviceable and broken down horses were gathered together in a park at City Point; there were quite six thousand of them. It was no difficult matter to make an inspection of them, one by one. They were all very thin, mostly broken down in front, wounded, some with broken knees; but there was not a single horse with a wound on the withers or over the kidneys.

Nosebag.—Among the minor articles of the cavalry equipment, the nosebag deserves notice. It is carefully

made of waterproof canvas and has a stamped leather bottom that looks quite like the crown of our shakos. The nosebag is fastened by a strap thrown over the head. The bottom is pierced by two small holes through which air is supplied, so that the horse can breathe freely when eating. The oats are then eaten without waste and are protected from dust and other impurities. By filling the holes with small sticks, a very convenient bucket is obtained, with which the horse can be watered in those districts where springs only are found, or where, as often occurs in America, water can be obtained only by digging, sometimes to great depths.

The Cavalryman.—While the American cavalryman has a firm seat, his position is not like that adopted in European services. He takes a fork seat, legs well extended, the sole of the foot resting in the stirrup. This position is in a great measure due to the shape of the saddle; one insensibly takes this position upon mounting a horse equipped with the American saddle. The rider is usually seen with lowered hand, leaving the horse entirely free. Our methods of drill, as in the infantry, have been exactly copied.

The Horse.—The American horse is gentle, rarely or never restive, and can endure great fatigue; his cleverness is quite remarkable. Speeding at full gallop, the customary American gait, he never stumbles over the stumps and branches that cover the ground. In height and build he resembles the horses of our cavalry of the line.

Supply of Horses.—The Quartermaster's Department is charged with the duty of supplying horses for the cavalry. The number required surpasses all belief, but it is partly explained by the raids. These are expeditions in which the cavalry lives on the country, traveling many miles in a few days, sometimes without finding water or

suitable forage. The greatest reason for this enormous waste of horses, is the lack of intelligent care, natural to an inexperienced horseman.

In 1863, there were in the Army of the Potomac, thirty-six regiments, whose effective strength varied, during the six months from May to October, between 10,000 and 14,000 men. This body of cavalry required:

In May,	5,673	remounts
In June,	6,327	"
In July,	4,716	"
In August,	5,499	"
In September,	5,829	"
In October,	7,336	"
Total,	35,380	

This is equivalent to a loss of two and one-half horses per man, or a rate of five horses per annum. And in addition, it must be remembered that this does not include horses captured from the enemy, which at its average, would probably amount to the entire remount for two months.

The report of the Secretary of War states: "If a similar state of affairs existed throughout all our cavalry, its 223 regiments would require 435,000 horses annually."

Great efforts were made to change this state of things, which had become a serious danger to the army. The Bureau of Cavalry, by a general order dated July 28, 1863, was directed to institute a system of monthly inspections of each regiment, the reports of which were sent to Washington.

Monthly Inspections.—These reports contained:

1. The service performed by the regiment since the last inspection; the number of miles marched by the reg-

iment; the quantity of forage distributed, water consumed, etc.

2. A classification of the horses as follows: 1. Horses unfit for service of any kind. 2. Those unfit for cavalry service but suitable for use with the train. 3. Horses that might be recuperated in the depots. 4. Serviceable cavalry horses.

Officers who appear from these reports to be negligent, are dismissed from the service; soldiers who are guilty of neglecting their horses are transferred to the infantry regiments of their State.

In spite of these inspections, it was necessary to resort to more severe measures, and an order was issued April 22, 1864, providing for a reduction of the effective strength of the cavalry. Regiments of cavalry not mounted, are employed as infantry. The horses of a number of partly mounted regiments are given to those that have the greatest proportion of their horses.

Officers' Horses.—Officers furnish their own horses, having the right to purchase their mounts at the horse depots. To fix the price of such horses, those in the depot are divided into a number of lots; each horse is valued at the average price of the lot to which it belongs. A horse thus purchased, must not be sold outside the military service. At the expiration of his term of service, an officer can sell his horse back to the Quartermaster's Department at an appraised valuation. When an officer changes station, his horse is transported by the government, unless the transfer is made at the officer's own request, in which case he must pay all expense.

Officers' Servants.—In the American army, the composition of the forces is such that an officer can not obtain

a servant from among the soldiers. Officers, for this reason, have servants that do not pertain to the military service. On the march, when the army is supplied with 8 or 12 days rations, an officer's servant carries his master's forage.

ARTILLERY.

We have seen that, by the creation of the Ordnance Corps, the duty of the artillery is limited to the service of troops. The remarkably wide-spread education of the American people has made it possible to raise a force of artillery that is really extraordinary. The regiments and batteries are fully equal to European troops.

Light and Heavy Artillery.—The artillery is divided into light and heavy artillery. The former is generally organized into batteries while the regimental organization prevails in the latter. Heavy artillery is generally employed in fortified places and, when serving in the field, acts only as infantry.

A battery consists of six pieces, six caissons, a forge and a battery wagon. The wagons and harness are patterned after those in use in the English and French services. Upon examining the equipment, we again find the excellent wooden stirrup, with a piece of leather attached to the stirrup strap to protect the leg from injury by the pole. Of the wagons, especial mention need only be made of the large train wagon. One driver only is required for each six-mule team; thereby reducing the personnel to a minimum. There are no battery reserves. Each piece is supplied with two hundred and fifty rounds of ammunition; two hundred in the chests of the limber and caisson, the remaining fifty with the army train ready to replace an empty chest.

The pieces in use are:

1. The *canon obusier*, smooth bore. (Napoleon gun).

2. The ten pounder rifled gun, wrought iron.

3. The ten and twenty pounder Parrott guns.

The *canon obusier*, of the same calibre as our own, differs from it in that the mouldings are omitted, the vent is normal to the axis and use is made of the pendulum hausse. It is much preferred to long ranging rifled guns. The terrain in America is generally broken and wooded and rarely affords opportunities for perceiving the enemy's columns at long range. The flat trajectory of the *canon obusier*, and the great value of canister and of ricochet fire, have made it the favorite gun in the American army. Rifled guns are rarely used except in batteries of position.

The ten pounder, wrought iron, gun is seventy-six millimetres in diameter. (Three inches). It is a rifled gun, firing an oblong projectile.

The Parrott guns, ten and twenty pounders, are of cast iron, secured with wrought iron bands at the breech. They are aimed by means of a sight much resembling that used in our service. The twist of the rifling is increasing and accurate results are obtained up to 1,700 metres. Effective firing may be done even at 2,500 metres. Cases of the bursting of these guns are extremely rare. The projectiles are cylindro-conical in shape. Solid shot, common shell and shrapnel are used. The rotation of the projectile is not obtained, as in French guns, by the pressure of a tenon against the inclined surface of the rifling. It is obtained either by the expansion of the base of the projectile or by that of a ring or envelope; the windage is thus wholly done away with.

Three projectiles are in use:

1. The Parrott projectile, which receives its rotation by the expansion of a brass ring enveloping the base of the projectile. Its action is often uncertain.

2. The Schenkl projectile. The base of the projectile is given the form of a fluted cone. Over this a piece of papier-maché is placed, which, slipping over the fluted cone is stretched, and entering the rifling does away with the windage and gives a rotary motion to the projectile. It is the best American projectile, its fire being accurate; it may however subject the piece to great wear.

3. The Hotchkiss projectile consists of two parts, united by a leaden jacket, which is expanded by the driving together of the two parts of the projectile and thus gives rise to rotary motion. Unlike the Schenkl projectile, it becomes deformed in transport, making loading difficult and sometimes impossible.

The cartridge bags are made of serge or floss silk, the latter being preferred.

The fuses in use are:

1. For the *canon obusier*, the Bormann metallic fuse, which is very satisfactory.

2. For the Schenkl projectile, the fuse of the same name, a percussion and time fuse. It is complicated and uncertain.

3. For the Parrott shell, the Parrott percussion fuse, with percussion cap like that used by infantry.

The friction primer is forty-five millimetres long and may be said never to miss fire. Its roughened wire is perpendicular to the axis of the vent.

Officers.—A large number of officers of the higher grades and general officers in the volunteer army, have

been furnished by the regular artillery. This has caused a great lack of suitable officers for the special staff service of the army. General Hunt, commander of the artillery of the Army of the Potomac, himself only a major in the regular army, has justly complained that he could not obtain most necessary subordinates, to act as intermediaries between him and his battery commanders.

The drill, as in the cases of the infantry and cavalry, is that of the French army.

The uniform is distinguished by the red braid.

ENGINEERS.

Duties.—The Engineer Corps performs the duties of the topographical service and of the pontonniers in addition to the ordinary duties of that arm in the French army. It also constructs a great number of civil works which with us are constructed by the corps of government engineers; among these may be mentioned lighthouses, bridges and even public monuments, such as the capitol and public buildings at Washington.

A general order, dated March 3, 1863, fixes the following organization for the Engineer Corps of the regular army:

1 General, Chief of Engineers.
5 Colonels.
10 Lieutenant Colonels.
20 Majors.
30 Captains.
30 First Lieutenants.
10 Second Lieutenants.

The same organization is also prescribed for the Engineer service of the volunteer army. What has been said of the recruitment of the artillery, applies also to the various branches of the engineer service. The companies of sappers, miners and pontonniers in the volunteer army perform their duties remarkably well; often in-

deed the greater part of these duties are performed by regiments of infantry. The mine which was exploded in front of the lines of Petersburg, July 30, 1864, had been constructed by a Pennsylvania regiment with a speed and boldness of which few European armies would have been capable. It is true this regiment had been recruited in the mining districts of the State. The Secretary of War, in his report, nevertheless complains of the insufficient strength of these special corps. As in the artillery, and even to a greater extent, the personnel of the Engineer Corps has furnished general officers for the volunteer army, thereby greatly reducing its own effective strength.

Principles Adopted.—The principles adopted by the American military engineers are those which have always prevailed in France. Vaubau, Cormontaigne, and, in the last few years, the authors treating of the polygonal system are the masters followed by the engineers, both in active service and in the construction of fortified places.

Permanent Fortifications.—This service has been greatly increased since the war began. In 1862, Congress appropriated $5,250,000 for the construction of permanent fortifications, and $700,000 for temporary works. These works, although possessing no especial peculiarities of trace, are remarkable for the excellence of the material employed, especially the granite, for the beauty of construction of the masonry and for the convenient arrangement of the casemates with their masonry platforms. Forts Richmond and Lafayette, defending the harbor of New York, may well be called models of military construction.

The topographical service was organized as a distinct corps until March 3, 1863; since that time it has been included in the Corps of Engineers. This service is of extreme importance, charged, as it is, with the survey of the

sea coast and lakes and with the making of all meteorological observations. Many of the methods employed have been devised by the officers of the corps, and are of great scientific merit. The report of the operations of the topographical service comprises three hundred and twenty pages of the report of the War Department.

On the first of October, 1863, there had been distributed 24,000 maps of the lakes, of which 4,000 were issued during the preceding year. Great need has been felt, since the war began, for military maps. The army continually operated in a country whose topography was but little known. During the year 1862-1863, the engineers made no less than 8,841 military maps; of these 6,927 were engraved and lithographed and 1,941 were reproduced by means of photographic processes.

The regular army alone is required to perform these duties; the volunteers, on the other hand, assist in a great measure in the work of temporary fortification and of bridge construction. We have seen companies of volunteer pontonniers who were perfectly well instructed.

The Army of the Potomac possesses six bridge trains, constructed like those of the French army. The boat weighs 300 pounds less than ours. This equipment has, in the crossings of the James and Rappahannock rivers, successfully endured the passing of large armies and immense trains.

Another system, lighter than the one just described, has been devised for use in the expeditions or raids of the cavalry. The pontoon is made of untarred English canvas, called duck, and, including its wooden frame, weighs only 700 pounds. A train of 31 carriages, each carrying 2,000 pounds, furnishes a bridge 127 metres in length.

The trestle bridges in use are similar to ours. Special mention is made of the Duane and Wing trestles. The skill of the American soldier in working with timber and the great abundance of material, have enabled the army to construct, in a very few days, remarkable fixed bridges with wooden piers.

Upon the occurence of a slight rain, the country is converted into a marsh. Timber is used in the construction of roads, without which the country soon becomes impassable. Plank roads are made by spiking or bolting planks to stringers of round timber. This roadway is not suitable for very heavy traffic; in such cases, corduroy roads are used. These are made by placing five or six tree trunks longitudinally and covering them with other timbers, laid transversely; a layer of earth and turf being used as a further covering.

Temporary fortification is greatly used in American warfare. Every time the army makes a movement, it promptly covers itself with entrenchments. The soldiers have acquired great skill in such work, the importance of which all of them understand. In front of Petersburg, a trench, ten kilometres in length, was, in two days, so well covered with field-works, as to be proof against attack. The especial features of the American field fortifications are the use of timber revetments, of thick abatis in front of the lines and of wire entanglements, made by fastening iron wire to stumps of trees, cut off two and one-half feet from the ground.

THE INVALIDS OR VETERANS.

The necessities of the war have given rise to the formation of the veteran corps. Men who have been so severely wounded as to be unfit for active service, who have become too much enfeebled by disease to return to the army, or who, being of weak, unformed constitutions, are liable to become at any time unfit for field duty, have been organized into a special corps for service in the garrisons and hospitals and for police and orderly duties. This method saves a great many good soldiers who would ordinarily be needed for such duties.

The loss of an arm or leg does not preclude entrance into the veteran corps; on the other hand, entrance is not compulsory. When a man has regained his strength sufficiently, he is, upon the report of the surgeon in charge of the hospital to the Adjutant General, returned to the army. Admissions to the veteran corps and restorations to the army are made by order of the Adjutant General upon the recommendations of the surgeons. If this method could not give rise to abuses, caused by more or less powerful personal influences, the organization of the veteran corps would be one of the features of the American army, most worthy of approval.

In November, 1862, the veteran corps, which was not created until the preceding April, already consisted

of 491 officers and 17,764 men. It was organized into two hundred and three companies; one hundred and sixty of which were formed into sixteen regiments. Each regiment consisted of two battalions; the first, consisting of six companies, was armed with rifles and employed in garrison duties. The second batalion, four companies, was armed with swords and pistols and was principally used in the hospitals as attendants, guards, orderlies, clerks, cooks, etc.

The officers are chosen with great care, upon the recommendation of the generals under whom they have served. The whole corps is considered to pertain entirely to the general government and no attention is paid to the States to which the members belong. The veteran corps does not perform any duties with the armies in the field; when, however, in July, 1864, Breckenridge's raid menaced Washington, such of the veterans as were then in that city were very usefully employed.

The uniform of the veterans is not like that of the army. It is grayish blue with deep blue facings. The collar of the blouse is also deep blue; the forage cap is of the same color as the facings.

THE SIGNAL CORPS.

The creation of a signal corps is due to the exigencies of the present war. This corps controls: 1. The aerial telegraphic signal service. 2. The field telegraph service. 3. The permanent electric telegraph system. Each of these branches is under the supervision of a colonel.

The Signal Bureau at Washington consists of three divisions. The first division has charge of the records, issues all orders and controls all matters pertaining to purchases and accountability. The second division issues all stores and receives and examines returns. The third division has charge of the personnel. The second division has received no less than a thousand returns during the year 1862-1863.

There are one hundred and ninety-eight officers of the Signal Corps, distributed as follows:

Army of the Potomac, - - -	36
Department of the Cumberland, -	42
Department of the Gulf, - - -	15
Department of North Carolina and Virginia,	18
Department of the South, - -	21
Department of the Susquehanna, - -	3
Department of the Tennessee, - -	41
Camp of Instruction at Georgetown, -	22
Total, - - - - -	198

Officers, non-commissioned officers and privates are subjected to examinations; the officers are commissioned, the others receive warrants. The examining board consists of five officers, one of whom belongs to the corps. The others are usually a colonel, two majors and a military surgeon. Officers are required to pass a successful examination in arithmetic, the elements of physics and chemistry, surveying, topography, the manual of signalling on the field of battle and the electric telegraph. Non-commissioned officers and privates who desire to receive warrants, must be able to read, write and keep accounts, and must possess a sufficient knowledge of geography. They must also be suitable both physically and morally.

Usually the signal corps of an army consists of one colonel, two majors, one captain, two first lieutenants, four second lieutenants, one sergeant, two first class privates and four second class privates.

The proportion of regular and volunteer officers has not been fixed; the latter now furnish by far the greater part. This is probably due to the recent date of the organization of the corps, 1861, and uncertainty as to what will become of it after the war is ended.

Visual signals are sent by means of a cipher code, which requires frequent change since it is easily discovered by the enemy. During the campaign following the crossing of the Rapidan, a Confederate signal station reported the number of the Union troops who were passing. Its cipher was known and General Meade was informed of its observations; they were entirely correct. This example is sufficient to show the importance of the service.

On the march or at a halt, signal stations, provided with telescopes, are placed on buildings or in trees. The

choice of these positions is a very delicate duty and devolves upon the most experienced officers.

All messages are confidential and require good judgment and great coolness. The Army of the Potomac had little other information of the movements of the Confederates. It cannot be denied that valuable information has been obtained by the army in this way and that the system has rendered good service. Still it must be very carefully controlled, as an error might sometime do serious damage.

General Smith, after crossing the James, broke the first two lines covering the approaches to Petersburg, but, having received a dispatch announcing the arrival of Beauregard's army, stopped in front of the third line. Beauregard's force was then opposing Butler at Bermuda Hundred and did not arrive until two days later. Smith failed to take Petersburg, which was then defenseless. When the attack was renewed, it caused a needless loss of nine thousand men.

The aerial signal corps is especially valuable in preserving communication between land and naval forces. This method of combined operations has been of frequent occurrence in the war and the signal corps has been continually used with great success. The officers of the corps are given a special course at the Naval School at Newport and at the Military Academy at West Point.

Signal stations are often much exposed and the following losses have been sustained by the corps during the year 1862-1863: Among the officers there have been four wounded, one missing, nine captured, two who died of wounds; being a total of sixteen. Among the non-commissioned officers and privates there have been six wounded, one missing, twenty-two captured, nine who died of sickness and one who died of wounds; a total of

thirty-nine. In view of the slight effective strength of the corps, these numbers are considerable.

FIELD TELEGRAPH SERVICE.

The field telegraph service pertains to the Signal Corps and is no less remarkable than the aerial signalling service. Whenever the army or an army corps makes a movement, it is followed by the field telegraph corps, supplied with wagons and apparatus. The different generals are at once placed in communication with the general-in-chief.

The apparatus used is, in general, similar to that used in the ordinary telegraph service. There are, however, a number of instruments, manufactured in New York, which are patented and kept secret. They have been very favorably considered and appear to be destined to replace the ordinary instruments.

The wagons carry a roll of wire upon a reel which turns as the wagon moves. By this device, the wire is rolled or unrolled without loss of time. The length of wire carried varies from five to ten miles. Lances are also carried and are fastened in the ground when houses or trees are not available to hold the wire. A hand reel of lighter and more flexible wire is also carried, to be used in places where the wagon can not go.

The wire used is insulated by means of a thick coating of rubber. When the army halts or whenever more permanent lines can be established, this wire is replaced by the ordinary galvanized wire.

The men in the telegraph service are sometimes civilians, sometimes soldiers; they are all subjected to the same discipline. Sometimes their work is done very near the line of battle. During the siege of Fort Wagner, the

sharpshooters were so close as to be able to cut the wires. Some of the wires were broken by bursting shells and were repaired under fire by the men of the corps.

There are thirty field telegraph trains in the army, distributed as follows:

Army of the Potomac,	5
Department of the Cumberland,	5
Department of the Gulf,	3
Department of North Carolina and Virginia,	3
Department of South Carolina,	2
Department of the Tennessee,	6
Department of the Ohio,	2
School at Georgetown,	3
School at West Point,	1
Total,	30

The greatest distance between two points, joined by a single instrument, was twenty miles, or thirty-two kilometres. Usually the distance varies between five and eight miles, or eight to twelve kilometres.

It is a great advantage for a general to be constantly kept in communication with the commanders of the corps of his army. If however, the facility leads him to remain at the central station and neglect to go in person over the scene of action, it may lead to serious results. No dispatch can be as useful as the seeing of what takes place with one's own eyes.

PERMANENT MILITARY TELEGRAPH SERVICE.

In America, the telegraph systems are not owned by the government, but are controlled by various companies. Owing to the necessity for maintaining a telegraph system which can be operated secretly and carefully, the government has been compelled to organize a permanent

military telegraph system. While this system pertains to the Signal Corps, it forms a special branch under the supervision of a colonel.

Each military department has its permanent military telegraph system under the direction of a captain, who is called an assistant superintendent. There had been established, between the outbreak of the war and July 1, 1862, three thousand, five hundred and seventy-one miles of telegraph line. During the year 1862-1863, the following lengths of line were constructed:

Army of the Potomac,	300 miles.
Department of Missouri,	548 "
Department of the Ohio,	510 "
Department of West Virginia,	97 "
Department of the Gulf,	300 "
Total,	1,755 "

During less than three years of war, there had therefore been constructed by the military telegraph corps, five thousand, three hundred and seventy-six miles of line, nearly one-fourth of the circumference of the earth. There had been forwarded, one million, two hundred thousand telegrams, averaging ten or twelve words in length; a daily average of about three thousand three hundred dispatches. These figures were very much increased during the later years of the war.

The service cost per month:

In 1861-1862,	$22,000
In 1862-1863,	38,500
In 1863-1864,	93,500
In 1864-1865,	22,800

The total cost of the permanent military telegraph system during the war, May 1, 1861, to June 30, 1869, was $2,655,580, or 13,277,900 francs.

THE ADJUTANT GENERAL'S DEPARTMENT.

The Adjutant General's Department includes the following divisions:

1. That of the Adjutant General, which has charge of the personnel of the army, the keeping of its rolls, the issue of commissions and brevets, and the publication of general orders.

2. That of the Provost Marshal General, which has charge of recruiting, the pursuit of deserters and the organization of the veteran corps.

3. That employed in the recruiting of colored troops.

The Department of Military Justice, under the direction of the Judge Advocate General, and that of the Inspector General, may be considered as supplementary branches of the Adjutant General's Department.

The personnel of the department consists of two Adjutants General with the rank of Brigadier General, and the following Assistant Adjutants General:

2 Colonels.
4 Lieutenant Colonels.
12 Majors.
38 Majors, volunteers.
250 Captains.

One Brigadier General, stationed at Washington, is in charge of the entire department with the title of the Adjutant General. The other is on special duty in the southeast in connection with the organization of troops. He is thus enabled to make decisions which would otherwise have to be obtained from Washington. A similar dual method of administration is necessary in all the special services, owing to the enormous distances over which the army necessarily operates. The department is however centralized in Washington, where it may properly be said to be organized.

At the central office of the department are stationed one Assistant Adjutant General with the rank of colonel, one lieutenant colonel, four majors and one captain of artillery, attached with the rank of major.

The other officers of the department are on detached service, some with the army, others on special duty. One lieutenant colonel is attached to the Army of the Potomac, where he serves as adjutant general with the rank of brigadier general. One lieutenant colonel and two majors serve as staff officers in the military departments. One major serves on the personal staff of the general-in-chief. One lieutenant colonel (provost marshal) and three majors superintend the recruiting service. One major has charge of the organization of the colored troops. This assignment to duties sufficiently indicates the various functions of the department.

A further report will be made of the different services, with the exception of those of the central office, which are not in any way unusual. The recruiting service is however worthy of study.

THE PROVOST MARSHAL.

The duties of the provost marshal are to superintend the recruiting service, the pursuit of deserters and the organization of the veteran corps.

The American army, we have seen, is composed of the Federal army, called the regular army, and of troops furnished by the States, called the volunteer army. The regular army is recruited by voluntary enlistment with bounty. The term of enlistment is five years. It was however reduced to three years, in order to correspond with that of the volunteers; finally, enlistments were temporarily suspended.

The volunteer army is composed of contingents furnished by the States in accordance with the authorized requisitions of the President. It would seem therefore, that these levies should be organized by virtue of the sovereign power of each State, without the intervention of the federal power. Such was the method of raising such troops until this war. Formerly, the general government did not concern itself with the volunteer regiments until they had been completely organized. The necessities of this war have, however, compelled the central government to adopt a method of conscription.

Upon the outbreak of war, the President, in a proclamation, dated April 12, 1861, made a call for 75,000 men. This force seemed at that time large enough to suppress the rebellion. These soldiers were to serve only three months. On the third of May, a further call was made for 42,000 men, to serve three years, to be organized into thirty-nine regiments of infantry and one of cavalry in the volunteer army. A call was also made for 22,714 men for the regular army and for 18,000 men for the navy. Owing to the great enthusiasm in the North,

this call yielded, before the first of July, seventy-one regiments of infantry, one regiment of heavy artillery and ten field batteries.

While the disaster at Bull Run, July first, destroyed the Union army, it only increased the patriotism of the people. The President was authorized by successive Acts of Congress, to accept enrollments until a force was obtained, consisting of a million men, whose terms of service varied from six months to three years. These Acts of Congress were published by the Adjutant General's department. The quota of the different States was not fixed. States, counties, patriotic societies and private citizens vied with each other in the organization of regiments and companies, raised by their own efforts. The confusion resulting from such a system may be readily imagined, yet it continued until February 21, 1862, when it was discontinued by an order of the Secretary of War. The army then consisted of no less than 637,126 men. The system of independent acceptances of volunteer troops was wholly abandoned and the contingents of the different States were fixed by the President. The States which had already furnished volunteers protested against this action on the ground that, being based upon the population of the States, it gave rise to a very great inequality of burdens. The number of volunteers raised prior to 1862 was credited to the States and deducted from their contingents in later calls.

Further calls for troops were made as follows:

July 2, 1862, - 300,000 men for three years.
August 4, 1862, - 300,000 men for nine months.
October 17, 1863, 300,000 men for three years.
March 14, 1864, - 500,000 men for three years.
July 18, 1864, - 500,000 men for three years.
December 19, 1864, 300,000 men for one, two and three years.

Between April 15, 1861, and April 14, 1865, calls had been made for 2,759,049 men to serve for terms varying from three months to three years. To these calls, 2,656,553 men responded and 102,496 were, upon the termination of hostilities, exempted from military service. These figures do not include 120,000 men furnished by the States of New York, New Jersey and Pennsylvania during the summer of 1863, and by Ohio, Indiana and Illinois during Morgan's raid.

In addition, the States of Missouri and Maryland, which, being situated on the border, were exposed to invasion by the Confederates, were authorized to have military forces pertaining only to the State. The Governor of Missouri, with a force of one regiment of infantry, two batteries of artillery and fourteen regiments of cavalry, amounting to 11,195 men, was able to repel the invasion of his State.

The first levies were obtained by voluntary enlistments without bounty. After July, 1861, Congress authorized a bounty of one hundred dollars to each man who enlisted for three years' service. Up to that time, nothing in the laws gave authority for any system of compulsory military service, and the States were enabled to respond fully to the calls for troops without recourse to any other method than that of voluntary enlistmont. The Confederate government had, however, since the latter part of 1861, had recourse to a system of obligatory service. Great difficulty was experienced in raising the troops needed for the war and it was found necessary to enact the recruiting laws of 1863 and 1864.

The law of 1863 is a mixture of the principles of our recruiting laws of 1818, 1832 and 1855. The usual method of recruiting is that of voluntary enlistment, and recourse is had to conscription only when the less severe

method fails to furnish the entire force. The conscripts, as by our law of 1818, are drawn by lot. They are permitted, as in our law of 1832, to furnish substitutes; or, as in our law of 1855, may become exempt by the payment of three hundred dollars.

The law of April, 1864, embodies the same principles except that exemption by purchase was not permitted unless in the case of Quakers and other sects, who are opposed to military service on religious grounds. Had the war continued, it is probable that substitution would have been prohibited, in view of the complaints embodied in the annual reports of the Provost Marshal. Conscripts were entitled to a bounty of only one hundred dollars.

The effect of the law authorizing exemption by purchase was to reduce the levy of 1863, by a force of 35,060 men and to furnish a sum of $10,518,000, which was used in the payment of bounties.

These bounties, which are one of the peculiar features of the American method of recruitment, have sometimes impeded rather than assisted the execution of the law. However high they were, men hesitated to enlist in the hope of receiving even greater sums as substitutes. The necessity for recourse to the system of conscription, repugnant to American customs, might be considered as rendering the patriotism of the States at least doubtful. States, counties, cities and societies made voluntary gifts in addition to the bounties authorized by Congress, hoping by this means to raise the entire contingents without using the method of conscription.

It must also be remembered that these bounties were considered by the Americans as donations to the families of the soldiers, nearly all of whom were married; and that in urging their increase, one was thought to be doing a charitable act. Bounties therefore assumed enormous

proportions; in 1864, regiments were furnished to the Army of the Potomac, every man of which had received a bounty of six hundred dollars.

This eagerness to avoid the use of conscription by increasing the bounties, began to be felt in 1862, after the July proclamation of the President. By the act of July 22, 1862, a bounty of one hundred dollars was paid to each volunteer. The voluntary gifts of States and private parties, raised the average bounty at that time to three hundred or three hundred and fifty dollars. By the law of 1862, a bounty of three hundred and two dollars was allowed to each volunteer who enlisted for a period of three years; a bounty of four hundred and two dollars was allowed to a soldier who had already served or to a regular soldier who enlisted for five years. The two dollars were to be paid to the man himself if he presented himself, or to any person who brought a volunteer to the recruiting station.

If, however, the soldier had been drafted and his service was obligatory, he was entitled only to a bounty of one hundred dollars. These bounties were paid to the soldier as follows:

Upon signing the rolls,	$ 2
Advanced bounty,	25
Upon arrival at his regiment,	50
After six months of service,	50
At the end of the first year,	50
At the end of the second year,	50
At the end of the third year,	50
At the end of the fourth year,	50
Upon the expiration of the term of service,	75
Total,	$402

This increase of bounty did not however, put an end to private bounties; in December, 1864, some levies re-

ceived as much as six hundred dollars. The total amount of such donations by States, counties, cities, corporations and private citizens, between the outbreak of war and February, 1864, reached the enormous sum of $187,209,608.62.

APPLICATION OF THE LAWS OF RECRUITMENT.

In each State, the recruiting service was superintended by a provost marshal, with the rank of colonel of cavalry, who was stationed at the capital. A provost marshal, with the rank of captain of cavalry, was stationed in each Congressional district.

A board was organized in each district consisting of the provost marshal as presiding officer, and two officers appointed by the President, one of whom was a surgeon. If the district was very large, other supplementary boards could be organized, so that the work of recruiting might be completed without unnecessary delay. The whole matter of recruiting was therefore managed entirely by the military power. This system seems less liberal than that of France, where the civil authority, participates in all the details of recruiting.

The first act was the making of the lists. These included all male inhabitants, between the ages of twenty and forty-five years, divided into two classes; the first including those between twenty and thirty-five years of age, the second, those between thirty-five and forty-five. No conscriptions were made of those in the second class until the first class was exhausted. No person was placed on the list who was not an American citizen or an alien, who had taken the oath of intention to become a citizen. Great difficulty was experienced in the making of these lists, owing to the incomplete state of all civil registers. They served, however, to put an end to the claims of

States, that they had been wronged in the fixing of their quotas. While the contingents of early levies had been based on the total number of inhabitants, it was found that a great difference existed in the proportion of males and females in the different States. In Massachusetts, New Hampshire, Rhode Island, Connecticut, New York, New Jersey and Maryland, the number of women was greatly in excess of the number of men. But in Ohio, Indiana, Illinois, Kentucky, Missouri, Michigan, Wisconsin, Iowa, Minnesota and Kansas, the male population was considerably the greater. The aggregate of the lists was 3,113,305 men, about nineteen and one-third per cent of the total population.

In some localities, the formation of the lists was strenuously resisted; officers, engaged in that duty, were set upon and one or two were killed. In Pennsylvania great opposition was made by the miners, a turbulent population, consisting mainly of Irish emigrants. Prompt measures, loyally supported by the local authorities, soon restored order.

The recruiting boards examined all cases of legal exemption or of exemption because of physical incapacity for service. The same legal exemptions are provided for as by the laws of France. Physical standards were adopted fixing the limits of height between five feet three inches and six feet four inches, and of weight between one hundred and ten and two hundred and twenty pounds.

Detailed tables showing the results of the system are embodied in the report of the Secretary of War. They are a sufficient evidence of the great care exercised in the work and show that, although this was the first application of a hitherto unknown law, few abuses were allowed to creep into the system.

An examination of the results of the system of exemptions because of physical incapacity, shows that the average number rejected in 1863 was three hundred and nineteen and one-tenth per thousand. This average in France, is found to be three hundred and twenty-four and four-tenths for the period 1831-1843; three hundred and seventeen for the year 1859. In England, during the period 1832-1851, it was three hundred and eighteen and six-tenths; during the year 1862, it was four hundred and one. In Belgium, for the period 1851-1855, this average was three hundred and twenty and six-tenths.

The decisions of the examining boards are final. Attempts having been made by civil tribunals in several States to examine into recruiting matters upon appeal, a proclamation was issued by the President, dated September seventeenth, suspending the privilege of the writ of habeas corpus in all matters pertaining to the application of the laws of recruiting. We shall now set forth the principal points of the laws upon this subject.

Every refractory recruit is treated as a deserter and brought before the nearest court-martial; he may by its finding be stricken from the rolls of his contingent. A conscript who procures a substitute is furnished with a certificate of discharge. The substitute is entitled to the same allowances as though not serving for another. If a conscript has furnished a substitute for a period of but one year, his name is, at the end of that time, restored to the lists.

By the law of 1863, colored men were not subject to draft, but by that of 1864, they were subjected to the same rules as white persons. Nor did the law create a difference of liability to service because of slavery. If a slave in a loyal State was conscripted, he became free. The bounty of one hundred dollars was however paid to

his master, in addition to damages determined by commissions appointed by the Secretary of War. The amount of such damages was limited however to three hundred dollars.

Men, accepted for service, are sent to their regiments by the provost marshal. The expenses of such men and of those who are returning after the completion of their terms of service, are provided for by the provost marshal's department. As soon as a soldier joins his corps or regiment, he comes under the jurisdiction of the adjutant general's department.

Fair and just application of the recruiting laws was assured by the imposition of severe penalties in cases of their violation. Any surgeon or member of a recruiting board, found guilty of receiving a gratuity of money or property in payment for exemption from service, is punished by removal from office, a fine of not less than three hundred nor more than ten thousand dollars, and imprisonment for a period determinable by the court-martial by which he is tried.

Members of recruiting boards are forbidden to engage in the business of furnishing or assisting in the furnishing of substitutes, under penalty of a fine of not less than one hundred nor more than one thousand dollars and imprisonment of not less than one nor more than six months.

Attempt to bribe a member of a recruiting board is punished by a fine of not less than five hundred dollars and imprisonment of not less than six months nor more than one year.

Any person who causes himself to be rejected by feigning sickness or injury, is treated as a deserter. Any person who procures or attempts to procure a false certificate, in order to deceive a recruiting board, is punished by

imprisonment for a period equal to that of the term of service of the person for whom the certificate was intended.

One feature of the law is worthy of imitation. This is the provision that the fee of any agent or attorney who procures the exemption of his client, shall not exceed five dollars; and that medical certificates shall be gratuitous. Any attorney who demands a greater fee than five dollars, any surgeon who demands a fee for a certificate, or any member of a recruiting board who accepts any remuneration, is liable to punishment by a fine not to exceed five hundred dollars and by imprisonment for a period of not less than six months nor more than one year. In such cases, one-half of the fine imposed, is paid to the person who causes the prosecution.

Lastly, any act of violence in opposition to the execution of the law or even advising such resistance, is punished by a fine not exceeding five thousand dollars and by imprisonment, not exceeding five years.

The conscription gave rise, in 1863, to terrible acts of violence which might have developed into revolution had not General Meade gained the victory of Gettysburg and driven Lee's army back across the Potomac.

The local authorities in Boston and Albany succeeded in suppressing the riots. In New York, however, a mob recruited among the large foreign population of the city and aided by many Southern refugees, overthrew the local authorities on the thirteenth of July, and for two days held control of the city, burning two recruiting offices and killing colored men and women. It became necessary to send troops to quell the disturbance and recruiting was impeded until the nineteenth of August.

In spite of the severity of the physical examinations by recruiting boards, many men who were unfit for service

entered the ranks. This led to a great waste of money. No less than two hundred thousand men were, before the end of the year 1863, sent home from the army because of physical disabilities, arising from weak constitutions or from sickness and wounds.

EFFECTIVE STRENGTH OF THE ARMY.

The strength of the American army was on May 1st, 1864, as follows:

With the colors,	662,345
On detached service,	109,348
In field hospitals or unfit for service,	41,266
In the hospitals or absent on account of sickness,	75,978
Absent with leave or prisoners of war,	66,290
Absent without leave, deserters,	15,483
Total,	970,710

These troops were distributed as follows:

Department of Washington,	42,124
Army of the Potomac and Ninth Corps,	141,160
Department of Virginia and North Carolina,	59,139
Department of the South,	18,165
Department of the Gulf,	61,866
Department of the Arkansas,	23,666
Department of the Tennessee	74,174
Department of the Missouri,	15,770
Department of the Northwest,	5,295
Department of Kansas,	4,798
Staff of the Division of the Mississippi,	476
Department of the Cumberland,	119,948

Department of the Ohio, - -	35,416
Department of the North, - -	9,546
Department of West Virginia, -	30,782
Department of the East, - - -	2,828
Department of the Susquehanna, -	2,970
Department of New Mexico, - -	3,454
Middle Department, - - -	5,627
Department of the Pacific, - -	5,141
Total, - - - -	662,345

General Grant, commander-in-chief, remained, with his staff, with the Army of the Potomac, which was commanded by General Meade. In March, 1865, the number of men serving with the colors was only 602,598. The total strength of the army was 965,561, but the number of deserters had increased to 19,683.

LOSSES OF THE ARMY DURING THE WAR.

There are few examples of battles as bloody as those of the American war of 1861-1864. The Federal loss in the battle of the Wilderness, which occurred after the crossing of the Rapidan and lasted three days, was 45,000 men.* Although the army consisted of only 140,000 men, it was not disorganized, but continued during three months a most difficult and glorious campaign.

The following table shows the losses of officers and enlisted men, from the beginning of the war until August 1, 1865.

ARMIES.	ARMS.	KILLED.		DIED OF WOUNDS.		DIED OF DISEASE.		MISSING IN ACTION.		ACCIDENTLY KILLED		EXECUTED BY SENTENCE.
		Officers.	Enlisted Men.	Officers.	Enlisted Men.	Officers.	Enlisted Men.	Officers.	Enlisted Men.	Officers.	Enlisted Men.	
REGULARS.	Cavalry.....	23	234	....	.....	18	470	5	293	..	....	1
	Artillery.....	32	308	..	.....	12	472	..	....	..	....	....
	Infantry.....	102	1,298	....	.....	53	1,807	28	973	..	....	....
	Total	157	1,890	....	.....	83	2,749	33	1,266	..	....	1
WHITE VOLUNTEERS.	Cavalry.....	378	6,816	144	4,018	331	24,702	13	508	..	46	....
	Artillery.....	79	1,630	47	955	99	8,725	4	324	..	4	....
	Infantry.	2,888	45,610	1,358	27,122	1,711	118,589	55	3,253	12	244	6
	Total	3,345	54,056	1,549	32,095	2,141	152,013	72	4,085	12	294	6
COLORED TROOPS.	Cavalry.....	3	99	1	32	1	883	2	139	..	....	....
	Artillery.....	3	36	1	31	16	3,508	1	8	..	....	....
	Infantry.....	118	1,655	44	974	73	21,820	15	1,128	..	....	....
	Total	124	1,790	46	1,037	90	26,211	18	1,275	..	....	....
GENERAL TOTAL		3,626	57,736	1,595	33,132	2,314	180,973	123	6,626	12	294	7

[*Official figures are 5,597 killed, 21,463 wounded, 10,677 missing,—total, 37,737.]

The Federal loss during the war was, therefore, 280,739 men. It must be noticed that while 90,882 were killed in battle or died of wounds, only 183,287 died of disease, including those who died as a result of ill-treatment in Confederate prisons. The number of deaths in Andersonville prison alone was 12,912. This statement shows more clearly than anything that could be written, the admirable sanitary condition of the American army.

DESERTION.

Desertion is one of the great plagues of the American army and was undoubtedly the cause of many of its defeats. The following table shows the number of desertions from the beginning of the war to August 1, 1865.

	REGULARS.			VOLUNTEERS.			COLORED TROOPS.			TOTAL.
	Cavalry.	Artillery.	Infantry.	Cavalry.	Artillery.	Infantry.	Cavalry.	Artillery.	Infantry.	
Officers.....	2	....	3	34	4	149	4	2	18	216
Enlisted Men.	1,866	3,162	11,332	31,856	11,942	126,231	674	1,843	9?3	189,829

These enormous numbers must be in part attributed to the personal weakness of the President, who, in spite of the necessities of the war, could not bring himself to approve a sentence of death, and in almost all cases commuted such sentences to imprisonment at hard labor until the end of the war. Another potent cause was the ease with which a deserter could avoid capture in a country so vast as America.

While desertion to the enemy is rare, some cases have occurred, especially among foreigners who were induced by the bounties to enter the service. In the interior, desertion assumed enormous proportions; the extent

of the country and the difficulty of maintaining an efficient police making it extremely easy.

Provost marshals of the States and districts are charged with the duty of searching for deserters. A reward of thirty dollars is paid to any citizen who brings a deserter to a recruiting station. Between the first of May and the first of November, 1863, twenty-two thousand deserters were arrested, which gives an idea of the great number of deserters. In addition there were large numbers absent without leave and remaining within their States because of personal influence.

The War Department has also been troubled with the absence without leave of officers. Two boards were organized at Annapolis and Cincinnati to examine into such cases; all those who proved themselves to be in ill-health were required to enter the hospitals, the rest were sent back to their regiments.

It has been frequently said that the Federal army consists mainly of foreigners. This assertion must be investigated. The population of America comprises a large number of persons, who have emigrated from Europe and yet have established themselves in the country and enjoy the rights of citizenship. In the States that remained loyal, the total number of foreign born persons was 3,923,648, nearly one-sixth of the entire population. The State of New York alone, with a total of 3,880,735 inhabitants, has a foreign born population of 998,460, of which 526,252 are Germans, and 498,072 are Irish.

Now the army, in the month of May, 1864, had an effective strength of 940,710 men. It ought to have as great a proportion of foreign born persons as were then in the general population. It had in fact 188,140 men, who were foreign born citizens.

Germans generally retain their language; in many countries they speak no other. The Hessians of the Revolution settled in Pennsylvania after that war, yet even now the greater part of their descendants do not speak English. At the beginning of the war the plan was adopted of forming German and Irish divisions, but this involved a great many inconveniences and soon had to be abandoned. There are to-day no organizations formed of distinct nationalities.

It is more difficult to estimate the number who enlisted among those who entered the country after the commencement of the war. The year 1854 was that during which there was the greatest immigration, the total being 256,177. In 1858, the number had fallen to 89,648. It increased during 1861 and, in 1862, New York received 76,316 immigrants. In 1863, the number had increased to 156,843, of which, it is true, only 78,520 remained in the city.

If it be assumed that the average yearly entry of emigrants during the years 1861-64, was 200,000, the calculation will certainly exceed the truth; of these 800,000, there would be 159,040 men between the ages of eighteen and forty-five years. If one-half of these enlisted, it would give as the total of foreigners serving in the army, 78,520. An estimate of this number can also be made from other data. The recruiting service in the city of New York, during the month of November, 1864, furnished an average of one hundred recruits daily. It was at this time that the State was making the most strenuous efforts to fill its quota of the call for 300,000 men, without recourse to conscription. The recruiting service had never worked so smoothly nor given such satisfactory results. One hundred men per day would give a yearly total of thirty thousand. Considering the large population of

New York, Brooklyn and Jersey City, 1,200,000 persons, it may be safely assumed that they would furnish one-half the total number of recruits. This would give, therefore, fifteen thousand as the average number of foreigners enlisted in one year in New York, and sixty thousand as the total for four years.

In assuming therefore, that 75,000 Europeans were enlisted in the Federal army, the facts are certainly exceeded. But since the total of the successive levies amounted to about 2,600,000 men, this hypothesis yields a proportion of about three per hundred. This is, in fact, about the proportion which we have noticed in the Army of the Potomac, in which there were a large number of New York regiments. These foreigners were generally very poor soldiers, furnishing nearly all the cases of desertion to the enemy. The levies of the State of New York furnished as deserters, 50 officers and 35,999 enlisted men.

The bureau of the Provost Marshal, charged with the recruiting service, with military police duties and with the organization of the veteran corps, expended during the year 1862-1863, one million, five hundred and thirty-nine thousand and fifteen dollars and ninety-four cents.

COLORED TROOPS.

At the beginning of the war, white persons only were permitted to join the army. The first law, aimed at the prejudice against colored persons, was the Act of Congress, dated March 13, 1862, forbidding any officer or employe of the government to use his power to return any fugitive slave to a disloyal master, under penalty of fine and removal from office.

On the 17th of July, the army was authorized to enlist colored men to work in the camps, construct field-works, etc. Finally, on the 22nd of September, the President issued a proclamation, liberating any slave whose owner persisted in rebellion after the first day of January 1863.

The first regiment of colored troops was raised in Louisiana, September 27, 1862. Other regiments were afterwards raised in the valley of the Mississippi, in Kansas, Arkansas and South Carolina. Eighteen regiments had been raised when, on May 22, 1863, the bureau of colored troops was organized.

The State of Massachusetts furnished two regiments of free-born colored men to the volunteer army. These regiments, known as the fifty-fourth and fifty-fifth Massachusetts infantry, were mustered into service March 20 and June 22, 1863, and distinguished themselves in the

assault on Morris Island, in Charleston Harbor. These regiments are not included in the organization we are discussing.

The eighteen regiments were reorganized, new ones were raised and a special system of numeration was adopted. The colored troops were declared to be Federal troops, not pertaining to any State. The officers, all of whom were white, were required to pass an examination before a special committee at Washington. Their commissions were issued by the President, upon the recommendation of the Secretary of War.

In November, 1863, the colored troops already numbered 38,787 men, distributed as follows:

2 Regiments of Engineers, - -	1,382
6 Regiments of Artillery, - -	3,716
51 Regiments of Infantry, - -	33,609

Regiments of cavalry were afterwards organized. Finally on July 15, 1865, there were in the service of the United States, colored troops as follows:

120 Regiments of Infantry, - -	98,938
12 Regiments of Siege Artillery, -	15,662
10 Batteries of Artillery, - -	1,311
7 Regiments of Cavalry, - -	7,245
Total, - - -	123,156

The total number of colored troops serving with the colors during the war was 186,017. They were furnished by the different States as follows:

Maine,	104
New Hampshire,	129
Vermont,	120
Rhode Island,	1,837
Massachusetts,	3,966
Connecticut,	1,764
New York,	4,125
New Jersey,	1,185
Pennsylvania,	8,612
Delaware,	954
Maryland,	8,718
District of Columbia,	3,269
Virginia,	5,723
North Carolina,	5,035
West Virginia,	196
South Carolina,	5,462
Georgia,	3,482
Florida,	1,044
Alabama,	4,969
Mississippi,	17,869
Louisiana,	24,052
Arkansas,	5,526
Tennessee,	20,133
Kentucky,	23,703
Michigan,	1,387
Ohio,	5,092
Indiana,	1,537
Illinois,	1,811
Missouri,	8,344
Minnesota,	104
Iowa,	440

Wisconsin,	165
Kansas,	2,080
Texas,	47
Territory of Colorado,	95
Not known,	5,816
Officers, white,	7,122
Total,	186,017

The sources from which these troops were drawn, indicate the proportion of free-born men and slaves. There were very great differences in the value of these troops. The free-born colored men, much more intelligent than the slaves, were fully equal in quality to the white troops and later in the war the slaves became as efficient. The negro is naturally a cavalryman and loves horses. He easily learns anything pertaining to drill or the handling of arms. We have seen regiments, after but two months service, drill in a very remarkable manner. After one repetition, the white officers left the ranks and the drill continued under command of the colored non-commissioned officers and appeared to be quite as good as before. In all the battles in which these troops fought, they gave such proofs of bravery that even the most prejudiced were compelled to do them justice.

INSPECTOR GENERAL'S DEPARTMENT.

The personnel of the Inspector General's Department consists of four Inspector's General, with the rank of colonel, and five Assistant Inspector's General, with the rank of major. To these were added a number of officers of volunteers, with the rank of lieutenant colonel, major or captain.

The duties of the department relate principally to the effective strength of the army, police, good order, discipline and the observance of military regulations. It is this department which prescribes matters of general police for the army; for example, fixing the prices at which sutlers must sell authorized articles to officers and enlisted men, etc.

The inspector general serving with the general-in-chief of an army, publishes any special regulations which he may make for the police of the camp; for example, the rules concerning burial of dead horses, etc. He also publishes constructions of general orders, and is charged with the duty of observing the method in which such orders and regulations are obeyed.

Officers of this department are also required to verify the effective strength of the troops. While performing these duties they are known as reviewing officers or commissaries of musters. When the contingent from a State arrives at the army, it is inspected by the mustering officer,

who verifies its effective strength and ascertains if that of its officers is as prescribed by law. After this is done, the troops are mustered into the service of the United States and receive the national flag.

When a regiment has completed its term of service, it is also inspected by officers of this department and, not until this inspection is completed, is it mustered out of service.

Every two months, all the Federal troops are inspected by mustering officers, who send their reports to Washington as a basis for payment.

The personnel of this department is insufficient for the requirements of the service, and officers are therefore attached to it for definite periods, who are also known as mustering officers. These officers are always drawn from the regular army.

A special peculiarity of the service of this department must be noted. Officers of the department are often sent on special inspections. If a general commanding an army, a corps, or a brigade, wishes to be informed as to the condition of an organization of his command, he sends an inspector, at an unexpected time, to review it. The general-in-chief causes an army corps to be inspected by an inspector with the rank of lieutenant colonel. The commander of an army corps sends an inspector with the rank of major, to inspect a brigade. The commander of a brigade sends an inspector with the rank of captain, to inspect a regiment.

The scope of these inspections is limited only by the orders under which they are made. Reports are confidential and relate to the discipline of the organization, its appearance, armament, effective strength, quarters, rations, etc. Such reports are sent every two months to the Secretary of War.

MILITARY JUSTICE.

The department of military justice pertains to the adjutant general's department. It is under the direction of a judge advocate general, with the rank of colonel. This officer is stationed at Washington and is appointed by the President, with the consent of the Senate.

Judge advocates, with the rank of major, serve with each army in the field; they, also, are appointed by the President, with the consent of the Senate. The records of all trials are sent, through the judge advocates, to the judge advocate general, who reviews them and makes special report thereon.

Justice is administered by general and regimental courts-martial, and by courts of inquiry.

A general court-martial consists of not less than five, nor more than thirteen members. The maximum number is always required whenever it can be assembled, without injury to the service.

Any general officer commanding an army, or colonel commanding a separate department or brigade, may convene a general court-martial. Its jurisdiction extends to all crimes and disorders committed by officers, non-commissioned officers and privates; its power of punishment extends to capital punishment or the dismissal of an officer. Officers are subject to trial by general court-martial

alone; in such cases, no member of the court should be inferior in rank to the accused. The judge advocate performs the duties of public prosecutor.

The regimental court-martial consists of only three members, all of them officers. Every commander of a regiment or corps has power to convene such a court-martial. A similar power is given to the commander of any garrison, post, or other place where the troops consist of different corps.

The jurisdiction of these inferior courts includes only minor offenses committed by non-commissioned officers and soldiers; they cannot inflict a greater fine than one month's pay, nor imprisonment at hard labor for a greater period than one month.

It is sometimes necessary to convene courts-martial, where officers of the army and of the marine corps are serving together. In such cases, the senior officer acts as presiding officer. An officer is designated as judge advocate to act as prosecutor. He is appointed by the general or by the officer commanding the detachment or garrison.

When the requisite number of officers to form a general court-martial is not present in any post or detachment, the commanding officer reports to the commanding officer of the department, who orders a court to be assembled at the nearest post; the accused and the witnesses are transported to the place where the court is assembled.

The court of inquiry is a purely American institution. It can be convened by any general officer or officer commanding a detachment, to inquire into any transaction of, or accusation or imputation against, any officer or soldier. It consists of one or more officers, not exceeding three. A judge advocate or other competent person

is designated, in addition, to reduce the proceedings and evidence to writing.

As the use of courts of inquiry might become destructive of discipline and be a dangerous weapon in the hands of passionate commanders, they can never be ordered except by authority of the President, unless upon the demand of the officer or soldier whose conduct is to be inquired of. The court of inquiry has no power to award punishment.

The judge advocate of a court-martial begins by administering the following oath to the members:

"You do swear that you will well and truly try and determine, according to evidence, the matter now before you, between the United States of America and the prisoner to be tried, and that you will duly administer justice, without partiality, favor, or affection, according to the provisions of the rules and articles for the government of the armies of the United States, and if any doubt should arise, not explained by said articles, then according to your conscience, the best of your understanding, and the custom of war in like cases. And you do further swear that you will not divulge the sentence of the court until it shall be published by the proper authority; neither will you disclose or discover the vote or opinion of any particular member of the court-martial, unless required to give evidence thereof as a witness, by a court of justice, in due course of law. So help you God."

The president of the court then administers to the judge advocate an oath in the following form:

"You do swear that you will not disclose or discover the vote or opinion of any particular member of the court-martial, unless required to give evidence thereof, as a witness, by a court of justice, in due course of law; nor

divulge the sentence of the court to any but the proper authority, until it shall be duly disclosed by the same. So help you God."

The accused is greatly protected from injustice. In accordance with the English system of trial, he declares at first, whether he wishes to plead guilty or not guilty. When, from obstinacy or design, he refuses to plead, or answers foreign to the purpose, the presumption is in his favor and the court may proceed to trial as if the prisoner had pleaded not guilty. The judge advocate or person designated as prosecutor, must, when the prisoner has made his plea, so far consider himself counsel for the prisoner as to object to any leading question to a witness, and to any question to the prisoner, the answer to which might tend to criminate himself.

The accused has the right to challenge any member of the court; he must however give his reasons, which are inquired into and judged by the court itself.

The following oath is administered to witnesses:

"You swear or affirm (this term is used in the case of Quakers who do not swear) that the evidence you shall give in the case now in hearing, shall be the truth, the whole truth, and nothing but the truth. So help you God."

When a witness is not a member of the army, his evidence may be obtained by deposition before a justice of the peace; then however, the prosecutor and the accused must be present, or must have been notified, in order to have an opportunity for impeachment.

A court-martial may punish at discretion, any person who makes any threats in its presence or disturbs its proceedings by any riot or disorder. The sessions of the court occur between the hours of eight in the morning

and three in the afternoon, except in cases where, in the opinion of the officer appointing the court, immediate example is required.

An officer who is accused, is placed in arrest in his quarters or tent, and deprived of his sword. Breach of arrest is punished by dismissal.

Non-commissioned officers and soldiers are imprisoned or allowed their liberty by proper authority. Arrest prior to trial must not exceed eight days; a court-martial must be convened within that time.

No officer commanding a post, or provost marshal, can refuse to receive a prisoner committed to his charge by an officer of the army, providing the officer committing, delivers an account in writing, signed by himself, of the crime or offense charged against the prisoner. And any officer, to whose charge prisoners have been committed, must within twenty-four hours, or as soon as he is relieved from his guard, report in writing, to the commanding officer, the names of such prisoners, the crimes charged against them, and the names of the officers committing them to his charge. If he fails to make such report, he is punished by a court-martial for disobedience and neglect.

Until the law of July 17, 1862, no sentence of capital punishment could be executed without the approval of the President. This law provides that sentences, inflicting the punishment of death, in the cases of spies, deserters, mutineers and murderers, may be executed upon the approval of the general commanding the army. But as this law does not divest the President of the power of pardon, it is rare that he is not informed in time to intervene.

An officer who is convicted, by a court-martial, of conduct unbecoming an officer and a gentleman, is dis-

missed from the service. An officer may be temporarily suspended from rank and deprived of his pay during the same period.

If an officer is dismissed from the service for cowardice or fraud, his name, crime, place of abode and punishment are published in the newspapers in and about the camp, and in the State from which he came, or where he usually resides, and it is scandalous for any officer to associate with him thereafter.

An officer who leaves his post without leave, may be sentenced to reduction to the ranks as a private and forced to serve three years or until the end of the war.

Prevention of the crime of selling military property is greatly facilitated by the provision of the law, by which possession of military property by a person, not in the military service, is declared sufficient proof of the crime; and it is the right and duty of any civil or military officer of the United States, to seize such property and cause it to be sent to the nearest depot of the quartermaster's department.

No sentence of death can be imposed, except by the concurrence of two-thirds of the members of a general court-martial.

No officer or soldier can be tried twice by a court-martial for the same offense. Nor can trial be held after two years, unless the accused has absented himself, or hidden; or unless the course of justice has been suspended during that period.

No right of appeal exists. In cases involving the sentence of death or the dismissal of an officer, the officer who convened the court, may suspend execution until the pleasure of the President may be known; in such cases,

he immediately transmits a copy of the entire proceedings of the court.

In all other cases, he has the right to mitigate the punishment or even to exercise the pardoning power.

The judge advocate or recorder of a general court-martial transmits as soon as possible, the entire proceedings and sentence of the court, to the Secretary of War. They are examined by the Judge Advocate General, in whose office they are carefully preserved. And every person tried by a general court-martial is, upon demand made by himself or by any person in his behalf, entitled to a copy of the proceedings and sentence of the court.

The procedure of a court of inquiry is quite similar to that of a court-martial. The recorder administers the following oath to each member:

"You shall well and truly examine and inquire, according to the evidence, into the matter now before you, without partiality, favor, affection, prejudice or hope of reward. So help you God."

The president then administers the following oath to the recorder:

"You do swear that you will, according to your best abilities, accurately and impartially record the proceedings of the court and the evidence to be given in the case in hearing. So help you God."

Witnesses are also sworn, and their testimony is limited to answers to questions put to them. The accused has the right to cross-examine the witnesses.

The proceedings of a court of inquiry must be authenticated by the signatures of the recorder and president thereof and must be delivered to the commanding officer. They may be admitted as evidence by a court-

martial, except in capital cases or those involving the dismissal of an officer. In such cases, oral testimony only is admitted. The proceedings are sent to the Secretary of War as in the case of courts-martial.

During the year 1862-1863, the bureau of the judge advocate general examined seventeen thousand three hundred and thirty-seven reports of proceedings of general courts-martial; two thousand three hundred and eighteen reports on the regularity of proceedings and applications for commutation or remission of sentences; and one hundred and seventy-two other documents relating to the administration of justice.

MEDICAL DEPARTMENT.

Sanitary Condition.—The sanitary condition of the American army is remarkably good. During the entire war, only two epidemics occurred—both in North Carolina, in the latter part of 1864. At Newbern there was an epidemic of yellow fever and, at the same time, typhoid fever was epidemic among the prisoners returning to Wilmington from the Southern prisons.

During the great heat of the months of June and July, 1864, the number sick in the Army of the Potomac, averaged only four per hundred. In General Ord's corps, which was camped in the low lands along the Appomattox, the number sick was for a short time eighteen per hundred. This condition was, however, remedied by the issue of quinine and whiskey.

In June, 1863, the number sick in the hospitals was nine and one-tenth per hundred; with the army it was four and four-tenths per hundred. This calculation is based on the total strength of the forces. Of this number, eleven per hundred were suffering from disease, and two and one-half per hundred from wounds. The mortality among all the cases treated during the year 1862-1863, was only three and nine-tenths per thousand.

During the march from Atlanta to Savannah, the health of Sherman's army was maintained in such a re-

markable manner that, of the forty thousand men, who reached Savannah after a march of more than two hundred miles, only one hundred and thirty-seven were sick. These results were probably due to the following causes:

1. The absolute prohibition of any kind of alcoholic liquors. In September, 1864, General Grant extended this prohibition so as to include officers, who were forbidden to use any liquor, not even wine.

2. The almost total absence of venereal diseases.

3. The personal cleanliness and daily ablutions customary in America.

4. The adoption for general use of a flannel shirt.

Statistical Tables and Diagrams.—Statistical reports of the health of the army are made with the greatest care. To these are attached diagrams showing graphically the information given in the tables.

The country in which the army operates has been divided into three great regions—the Atlantic Slope, the Mississippi Valley and the Pacific Slope. The Atlantic Slope extends from the Alleghanies to the ocean; the valley of the Mississippi and its tributaries, from the Alleghanies to the Rocky Mountains; the Pacific Slope from the Rocky Mountains to the ocean. In the diagrams these regions are represented respectively by vertical, horizontal and diagonal shading lines.

The mortality in the American army during the first year of the war was sixty-seven and six-tenths per thousand, of which fifty and four-tenths died of disease and seventeen and two-tenths of wounds or other causes.

The average mortality during peace, deduced from a period of eight years, was twenty-four per thousand. During the war with Mexico, it was one hundred and three and eight-tenths per thousand.

The mortality of the English army during the Crimean War averaged two hundred and thirty-two per thousand; but in time of peace, in 1859, it was only nine per thousand, much less than the peace average of the American army.

It is also worthy of notice how unequal is the distribution of the mortality among the three great divisions of the country. In the Pacific Slope, where however the war was not in progress, the average mortality was only ten and forty-seven hundredths per thousand. This average is much less than that of the whole army during peace, a fact of considerable importance in the future settlement of the country.

Tables are also prepared showing the average sickness per thousand men, and the average number sick with each class of disease.

These tables do not show the average number sick, but the average number of cases treated per month, so that many men are counted more than once. In the central region there were, for each thousand men, 3,368.14 cases of sickness; in the Atlantic region, 2,748.83; in the Pacific region, 2,586.60.

Such tables are especially useful in making transfers of patients. It is a principle of treatment in the American army, to remove patients as soon as possible from the climatic conditions in which they have become sick.

Tables showing the number, kind and location of wounds are also made with equal care. We have seen a work of this kind which was prepared after the battle of the Wilderness, but were not, unfortunately, permitted to obtain a copy.

Meteorological Tables.—The medical department is also engaged in meteorological observations, the annual

consolidated report of which is an important work. The tables show for each day the readings of the barometer, thermometer and hygrometer, the direction of the wind, the amount of rainfall and the state of the weather. The bureau of military pensions also pertains to the medical department.

Museum.—Mention must be made of the medical museum, a creation of the medical department, destined to become of great scientific importance. A collection has been made of a series of well prepared anatomical specimens, showing the most remarkable wounds and the organic lesions arising from the diseases which prevail in the armies. This collection is, unfortunately, rapidly increasing; among its specimens, is the leg, which was lost at Gettysburg by General Sickles, who is, however, still in active service.

Administration.—One peculiarity of the American medical department is the great power of a surgeon, who is charged with all the administrative duties of the medical service. The surgeon in charge of a hospital or field hospital makes requisitions directly upon the quartermaster or commissary.

Purveyors.—Tents, straw, buildings, wagons and horses are furnished by the quartermaster's department; rations, by the subsistence department. Although there are only four great supply corps in the army, the medical department includes a purveying corps, consisting of a number of surgeons, called *medical purveyors*, and a number of medical store-keepers. Linen, iron bunks, ranges, tableware, medicines, books and surgical instruments are supplied by the purveying service.

The central office of this supply service is at Philadelphia; its storehouses are at New York, Philadelphia,

Baltimore, Cincinnati, Louisville, Saint Louis, Memphis, Nashville, Chicago, San Francisco, Hilton Head, Salem, Fortress Monroe, Newbern, New Orleans, Washington and other places. To give an idea of the great importance of the service it will be sufficient to note that the value of the issues of the purveyor's depot at Washington during the year 1863-1864, was $1,500,000; that of the receipts, $4,000,000. In order to meet all the requirements of war, it has been found necessary to employ in this service, men of known commercial ability. Thus the medical storekeeper of the depot at Washington is a rich, retired merchant, formerly of New York.

A medical purveyor is subordinate to the medical director of the department in which his depot is situated. Money and property accounts are sent to the medical director, who, after endorsing thereon his approval, and a statement that the amount and quality of the stores on hand have been verified, and the reasons for their purchase found satisfactory, sends them to the Surgeon General at Washington. They are then transmitted to the Treasury Department, where they are examined by the auditors. Funds are placed to the credit of a purveyor, to enable him to pay for stores which he is ordered to purchase. By this means the furnishing of supplies is greatly expedited.

Surgical Instruments.—Each surgeon is furnished with a complete set of surgical instruments, which he is forbidden to use, except in the public service. These instruments are inspected annually, during the first three days of December, and those which require repairs are returned to the depots. The officers, in whose care instruments are given, are held accountable for damages thereto.

Personnel.—The personnel of the medical service, like that of the army, is divided into regulars and volun-

teers. Volunteer surgeons pertaining to regiments, are appointed by the governors of the States; all are, however, subjected to examinations to determine their fitness for the service.

The following table shows the personnel, pay and allowances of the medical service. There are, in addition, a thousand or more surgeons who are engaged under contracts for a period of three months or for the entire war. Contracts of the latter class are voidable upon one month's notice by the surgeon.

CLASSIFICATION AND RANK OF OFFICERS.	NUMBER IN SERVICE.		PAY.	SUBSISTENCE.		SERVANTS.		TOTAL MONTHLY PAY.	NUMBER OF HORSES FOR WHICH FORAGE IS FURNISHED.
	Regulars.	Volunteers.	Per month.	Number of rations per day.	Monthly commutation value.	Number of servants allowed.	Monthly commutation value.		
Surgeon General—Brigadier General	1	.....	$124 00	12	$108 00	3	$67 50	$299 50	4
Assistant Surgeon General—Colonel	1	.....	110 00	6	54 00	2	47 00	211 00	2
Medical Inspector General—Colonel	1	.....	110 00	6	54 00	2	47 00	211 00	2
Medical Inspectors—Lieutenant Colonel	16	.....	95 00	5	45 00	2	47 00	187 00	2
Surgeons of ten years service—Major	50	2,200	80 00	8	72 00	2	47 00	199 00	2
Surgeons of less than ten years service—Major			80 00	4	36 00	2	47 00	163 00	2
Assistant Surgeons of ten years service—Captain	50	.....	70 00	8	72 00	1	23 50	165 50	2
Assistant Surgeons of five years service—First Lieutenant	104	.....	70 00	4	36 00	1	23 50	129 50	2
Assistant Surgeons of less than five years service—First Lieutenant		4,250	53 33	4	36 00	1	23 50	112 83	2
Medical Cadets—Second Lieutenant	50	.....	.....	.....	.....	.....	.....	30 00	.....
Medical Storekeepers—Second Lieutenant	6	.....	.....	.....	.....	.....	.....	124 16	.....
Hospital Stewards, 1st class—Ordnance Sergeant	.....	.....	.....	.....	.....	.....	.....	22 00	.....
Hospital Stewards, 2d class—Ordnance Sergeant	.....	.....	.....	.....	.....	.....	.....	20 00	.....

Surgeon General.—The Surgeon General, stationed at Washington, is charged with the administration of the entire medical service. His responsibility is immense, since he makes or approves contracts amounting to several millions of dollars. Like all public officials in America, he is subjected to close scrutiny by Congress and the general public. Surgeon General Hammond, who occupied that position during the year 1863, was tried by court-martial in 1864, and sentenced to dismissal with disqualification to hold public office. He was a man who was generally liked, and was found guilty only of weakness, in having received presents from contractors.

Assistant Surgeon General.—The Assistant Surgeon General is stationed at Louisville. Similar divisions of authority are made in all the supply and staff departments, in order to prevent the vexatious delays that would result, were final authority centered entirely at Washington.

In addition to the two great divisions controlled by the Surgeon General and the Assistant Surgeon General, there are a number of medical departments corresponding to the military departments, into which the country and armies are divided. Each medical department is controlled by a medical director, with the rank of major, who is himself subordinate to the Surgeon General.

Medical Inspector—All the operations of the medical department are supervised by a corps of medical inspectors, the chief of which, the Medical Inspector General, is stationed at Washington. This system, which is yet new, has not yielded as good results as might be expected. The inspectors, appointed by the President, in addition to the regular organization of the service, often for political reasons, have not been as well obeyed by the medical directors as is necessary for good results. The medical

directors have often been supported in their resistance by the military authorities. For example, General Sherman required an inspector to furnish to the medical director of a department, which he had inspected, a duplicate of his report.

It was proposed to change the duties of the inspectors so as to make them, during their tours of inspection, assistants to the medical directors, who would hold the temporary rank of colonel. This idea has, however, been abandoned and the necessary inspections are now made by the medical directors, accompanied by the assistant surgeons composing their staffs.

The medical cadets are students who serve in the hospitals, and from amongst whom the regular medical service is recruited. They are assimilated in rank and pay to the cadets at West Point. The importance of the duties of the medical storekeepers has been previously mentioned.

Hospital Stewards.—The duties of the hospital stewards are partly those of administrative clerks and partly those of apothecaries; they are also practiced in all the minor operations of surgery. They are usually trusted men, who are placed in charge of the various branches of the internal service of the hospitals, the kitchen, dispensary, etc. They receive increased pay in such cases, varying in proportion to the duties they perform.

In addition to the personnel already described, the medical service includes male and female attendants, matrons, Sisters of Charity, Sisters of Mercy and soldiers or veterans, whose duties will be described hereafter.

The medical service lost during the war three hundred and thirty-five officers, as follows:

Killed in action,	29
Accidentally killed,	12
Died of wounds,	10
Died in the prisons of the enemy,	4
Died of yellow fever,	7
Died of cholera,	3
Died from various causes,	270

Thirty-five officers were wounded in action.

Cost of the Medical Service.—The expenses of the medical service during the year 1862-1863, are shown in the following statement:

Pay of officers and stewards,	$ 484,196.64
Pay of attendants, clerks, laborers, etc.,	544,132.68
Medicines, instruments, hospital stores, etc.,	10,566,337.03
Total,	$11,594,666.35
During the year 1863-1864,	$11,025,791.33
During the year 1864-1865,	$19,328,599.63

The medical service may be divided into two great divisions—the service of fixed hospitals and that of armies in the field.

HOSPITALS.

Permanent Hospitals.—There were, in the United States, at the end of the war, two hundred and four general military hospitals, large or small, containing one hundred and thirty-six thousand eight hundred and ninety-four beds. During the period of hostilities, one million and fifty-seven thousand, four hundred and twenty-three cases were treated in the hospitals. In addition to specially constructed hospital buildings, use was made of various public buildings, churches and halls. Hospital build-

ings are constructed of wood, as are in fact most American buildings. After five years usage, it is customary to abandon a hospital, since the surgeons declare that, notwithstanding the most scrupulous cleanliness, the materials are then impregnated with dangerous germs. The hospital is therefore torn down and rebuilt on another site.

Hospitals are usually located on high ground, just outside a city, and close to a railroad. A visitor is struck with the good order and cleanliness of the hospital, the comfort of the sick and the entire absence of the nauseating odor which prevails in even our best kept hospitals. The latrines even are odorless, being continually flushed with large volumes of water. In the wards, in which are placed patients with the most purulent wounds or diseases, the same absence of odor is found. In such cases the best disinfectant is a compress of coffee grounds over the wound.

Hospital at Chestnut Hill.—A description is here given of the hospital at Chestnut Hill, about three miles outside of Philadelphia. It may be taken as a description of the typical American military hospital, since most of them are constructed on a similar plan. The hospital is made of wood and plastered on the outside; the plastering is, however, usually on the inside, exception being made in this case because there was not time to wait for it to dry. The floors are raised above the ground and the roofs are covered with fire-proof bituminous paper. The hospital is designed for three thousand six hundred patients, but, at the time of our visit, contained six more than that number. It was built in ninety days, and was planned and supervised by its medical director. The contractor had undertaken to construct the building in sixty-six days, but a delay of twenty-four days was occasioned

by the fact that a county road traversed the site. The hospital is situated alongside the railroad from Philadelphia, and occupies an area of about fifteen acres.

Fifty wards are arranged radially, all connected by a large gallery, which is used as a promenade by the patients. This gallery is lighted by an interior court, nearly two and a half acres in area, in which are located the administration building, the reservoir, library, chapel, and other buildings.

At the railroad is a small building used as a depot or landing place. To the right, behind the hospital, is a small encampment, which is used as a promenade by the convalescents. A number of barracks have been built in which certain diseases are treated. Games of various kinds are provided, at which the sick are permitted to play.

The whole edifice is surrounded by a simple picket fence, four feet in height; and so customary is obedience to regulations that this fence is entirely sufficient. The site is elevated and forms a clearing in the timber.

At the center of the entire building is an enormous reservoir of water, connected by pipes with all the wards. There is also a hot water supply system, operated by a steam boiler, near the laundry. The supply of illuminating gas is obtained from a plant in Philadelphia. Rails are placed along all the corridors, upon which run cars, which are very useful in many ways.

The kitchen is a marvel of neatness and is under the special direction of a hospital steward. A noticeable feature is the use of steam in cooking the vegetables. There is a small separate kitchen in which are prepared all delicacies ordered by the surgeons; such, for example, as chickens, cake, fruits and ices. The evening before

our visit, there were distributed seventy fruit ices, which had been obtained in Philadelphia. The dispensary is well supplied with medicines and stores, and is under the direction of a hospital steward.

Mention must also be made of the numerous storehouses for clothing and supplies of all kinds, of the operating room, with benches for the surgeons and cadets, of the postoffice, and lastly, of a rotunda, in which concerts are given every day by a band organized in the hospital. During the summer, fountains in the large gallery furnish ice water, which is considered a necessity in America. In winter, a large number of stoves are used and a uniform temperature maintained.

The wards are all built on the same plan, being one hundred and forty-nine feet in length, twenty-three feet and eight inches in width, and fourteen feet in height. They contain sixty-three beds, of which sixty are for the patients, two for the attendants and one for the ward master, who is a convalescent. To the right of the entrance to the gallery, is a small dining room with a pantry containing all necessary articles of tableware, such as plates, knives, forks, spoons and glasses. Those patients who receive only portions of the ration, and others who are authorized by the surgeons, take their meals by themselves in the ward. To the left is the ward master's room. At the other end of the ward, toward the outside of the hospital, are latrines, well kept and odorless, flushed by a continuous stream of water. Opposite the latrines is a bath-room, the waste water from which is carried off by means of a pipe. The raising of the floor above the ground facilitates this system. Each ward is lighted by thirty windows, fifteen on each side. The system of heating and ventilation is the same as that of the regimental hospitals, which will be described hereafter under

the heading Quartermaster's Department. Additional inlets, which may be closed if desired, are provided at the surface of the ground.

In such a system of construction, fires are much to be feared. A fire department, including all employes and convalescents, is kept constantly ready for duty. A telegraph system connects all parts of the hospital with a central office, and gives such speedy notice of the occurrence of a fire that it seems almost impossible that it should not be promptly controlled.

In addition to the buildings already described, are a library, a chapel and a school. The library contains six thousand volumes, and patients are permitted to borrow books for a limited time.

The food furnished is excellent in every respect and, except in the cases of patients subjected to special diet, is not divided into portions. In every dining room notices are posted, saying that patients may eat all they wish, but must not waste the food.

Personnel.—The director of the hospital is a surgeon with the rank of major, and is called the surgeon-in-charge. He has control of all matters pertaining to the hospital, whether relative to administrative or medical duties, or to discipline. Although his military rank is assimilated, he has charge of the company of veterans serving as police and gives daily orders to its captain. He is entitled to military honors. Next in rank is the executive surgeon, also a major, who acts for the surgeon-in-charge in his absence, or in cases or emergency.

There are thirty-six assistant surgeons, with the rank of captain or lieutenant, who perform all the duties of attending the patients. To each of these, certain wards or beds are definitely assigned. Daily reports are made to

the surgeon-in-charge, through the executive surgeon. No amputation is permitted, except upon the special authority of the surgeon-in-charge. These assistant surgeons are quartered in the hospital, where they also have a mess. They must obtain permission to be absent, and such permission is granted for lengthy periods only when the applicant furnishes a substitute, approved by the surgeon-in-charge.

A number of medical cadets are also quartered in the hospital; they accompany and assist the surgeons, under whose orders they are placed. There are eight hospital stewards, to each of whom is assigned a special branch of the internal service. The laundry is managed by a hospital matron. Two attendants are provided for each ward. These are either persons hired by the hospital, or soldiers of the veteran corps; the latter system is becoming more frequent than the former. A large force of clerks is employed in preparing the records and accounts of the hospital, which, as is usual in such matters in America, are kept with surprising care. A small printing office is attached to the record office.

Entry into Hospital.—Patients, upon arrival, are received at the depot, where they are weighed and measured and have their complete descriptions recorded. The descriptive list of each patient shows his state, the regiment, company, army corps and army to which he belongs, his occupation and the address of his parents or friends. His clothing is then carefully packed and marked and he is furnished with hospital clothing, consisting of coat, trousers, slippers and under-clothing. A patient may, however, if he desires, retain any or all of his own under-clothing. He is then furnished with his hospital number, the number of his ward and bed, to which he is at once conveyed.

One store-house is devoted entirely to the safe keeping of the effects of patients. It contains as many cases as there are beds in the hospital, and the effects of each patient are packed in the case corresponding in number to his bed. If a patient dies, notice is sent to his parents or friends, and if they request it, his effects are sent to them, even though, being usually military clothing, they rightfully belong to the government. Upon the recovery of a patient, notice is sent to his regiment, and his effects are returned to him. He usually draws, from the quartermaster's store-houses at the hospital, a complete new equipment; notice of such issues is sent to the soldier's regiment. The soldier, upon leaving the hospital, is not, however, entirely fit for service with his regiment, and is sent instead to a convalescent camp. These camps will be described later in this report.

Method of Accounting—The government makes an allowance of twenty-five and one-half cents per day for each patient. With this amount the surgeon-in-charge supplies all the needs of the hospital. These funds are not, however, furnished to the surgeon-in-charge. He makes requisitions for necessary supplies, either from the quartermaster's or subsistence departments, or from the purveying service. In large hospitals these requistions are made for periods of eight days, but in the smaller and more distant hospitals they are made for a month or even a year. The accounts are kept at Washington, and notices are sent to the surgeon-in-charge, informing him whether he has drawn more or less than his allowance. Requisitions and statements of accounts always pass through the office of the medical director of the department. Any surplus existing after all regular supplies are drawn, is used by the surgeon-in-charge in the purchase of sugar, coffee, rice and other articles.

The surgeon's prescriptions often require articles not embraced in the regular supply table; these are purchased by the surgeon-in-charge, who sends the accounts to the quartermaster's or subsistence departments, or to the medical purveyor, by whom payment is made.

The only fund in the hands of the surgeon-in-charge, arises from the sale of old straw and rubbish; what is known in our regiments as *les eaux grasses.*

This fund is often quite large, being, at Chestnut Hill, as much as five hundred dollars a month. The expenditure of this fund is not regulated, although accounts are rendered, showing the total amount on hand. Out of this fund, the surgeon-in-charge, at Chestnut Hill, has constructed an entire barracks for the use of his small garrison of veterans.

Inspections by Medical Inspectors.—Every month, an inspection of the hospital is made by a medical inspector. Mention has been made of the difficulties arising in such inspections from the resistance of the medical directors of departments.

The personnel of a hospital and the patients are paid by the pay department, on accounts drawn up in the office of the surgeon-in-charge. A paymaster is stationed at each of the most important hospitals.

Records and Reports.—The following list comprises the record books and administrative papers kept in the office of the surgeon-in-charge of a hospital.

Meteorological register.

Index to meteorological register.

Register of patients, showing for each patient his hospital number, annual number [number one corresponding to the first day of January], army, army corps, regi-

ment, company, state, occupation and the address of his parents or friends.

Index to register of patients.

Index by states to register of patients.

Register of patients in each ward, showing the method and progress of treatment.

Register of surgical operations, showing the origin of the injury and the result of the operation.

Register of officers, treated in the hospital.

Morning report of each ward.

Monthly report, to be sent to the medical director.

Consolidated report, to remain at the hospital.

Annual report of surgical instruments.

List of wounds and diseases, showing that of each patient.

Case, diet and prescription book—showing the special diet of each patient.

Forms for oath of allegiance.

Contracts with private physicians.

Contracts with attendants.

Muster-roll of the hospital, for the paymaster.

Report of persons on duty in the hospital.

Certificates of disability upon which leaves of absence of officers are based.

Certificates of disability for enlisted men.

Certificates of discharge.

Certificates showing right to pension, to be sent only to the Secretary of War.

Certificates of death and interment.

Notices of death, to be sent to the regiment of the deceased.

Label cards for each bed, showing most of the entry in the register of patients.

Passes for patients.

Forms for requisition on the quartermaster's and subsistence departments and the medical purveyor.

Invoices of stores received.

Statements showing the accounts of the hospital with the various supply departments.

Inventories of medicines, furniture, subsistence stores and other supplies on hand.

Statement of articles of special diet issued during the month.

Officers in Hospital.—Any officer on leave or traveling on duty, may enter the hospital at a daily charge of one dollar. If, however, the officer is not sick, but is merely boarding at the hospital as a matter of convenience, the daily charge is one dollar and thirty cents. At the end of each month payment is made to the medical officer acting as treasurer. If an officer has no money, certificates in triplicate are drawn up and transmitted to the paymaster stationed at the hospital, who notifies the officer's regiment or corps, and forwards the statements upon the departure of the officer. (Order of March 29, 1864.)

CONVALESCENT CAMPS.

Arrival of Soldiers.—The nature of the war has forced the American armies to operate at great distances from their bases, with lines of communication often insecure and sometimes entirely intercepted. This fact has prevented the sending of soldiers to their regiments as soon as they leave the hospital.

For this reason, as soon as the condition of a patient is so far improved as to make a relapse improbable, he is sent to a camp of convalescents.

Departure of Soldiers to Join Their Regiments.—These camps are entirely in the control of the military authorities and are commanded by colonels; the soldiers are subjected to the strictest discipline. They are armed and are gradually returned to duty; when their health and strength have entirely returned, they are sent to the armies to which they belong, in armed detachments, of sufficient size for defense against guerrillas.

Description of the Camp at Fairfax.—The camp at Fairfax, four miles from Washington, is a model of the establishments of this kind. When we visited this camp, it was commanded by a colonel, who was assisted by a large number of officers.

The barracks, fifty in number, each contained fifty double bunks, arranged twenty-five on a side. The total capacity was thus five thousand men, which number was, however, far from being attained on the 14th of June, 1864. It had, however, been much exceeded a few months previous to that time; tents were erected so as to quarter fifteen thousand convalescents. During the year 1863, one hundred and seventy thousand convalescents were received at this camp.

Everything is provided which would tend to keep soldiers from being tempted to leave the camp. There are promenades, a chapel, a library containing six thousand volumes, well-stocked sutler's stores, and quarters for officer's families; sisters of soldiers are often authorized to remain in the camp and no inconvenience has resulted. The camp is, in reality, quite like a city.

There are numerous other buildings, including an ordnance store-house, commanded by an officer of the

ordnance corps, and storehouses of the quartermaster's and subsistence departments. A soldier, upon leaving the camp, is furnished with arms and clothing as completely as could be done at one of our best equipped regimental magazines.

Six hundred different newspapers are received each day, and no less than ten thousand letters are received at the postoffice.

The camp was constructed in three months and was first used on the 1st day of March, 1863. The troops were employed in its construction, although such uses of troops are unusual. Before the 1st day of July, 1863, all the various annexes had been completed.

MEDICAL SERVICE IN THE FIELD

Organization of the Medical Service of an Army.—The medical service of an army is under the direction of the medical director of the army, who is assisted by one surgeon. Each army corps has a medical director; each division, a chief medical officer; each regiment, one surgeon, two assistant surgeons and a hospital steward.

Each army has a permanent hospital, situated usually six or eight miles to its rear, the position of which is changed only when an important movement is made. The movable hospital, which we call the *grande ambulance*, is established within reach of the field, whenever a battle is imminent.

Ambulance Train.—The medical service requires, in the field, large supplies of tentage and wagons; this material is under the control of the medical directors.

The regular allowance of tentage, for a regiment of ten companies, is three hospital tents and two common

tents. Each hospital tent will accommodate from eight to ten patients.

An allowance of two-horse ambulances is made on the following basis: three to each infantry regiment of five hundred men or more; two to each regiment of infantry of more than two hundred, but less than five hundred men; one to each infantry regiment of two hundred men or less; two to each cavalry regiment of five hundred men or more; one to each cavalry regiment of less than five hundred men; one to each battery of artillery, and one to each headquarters of an army corps.

One ordinary medicine wagon and one medicine wagon with an amputation table, are allowed to each brigade. Three large wagons are allowed to each fifteen hundred men.

These ambulances and wagons merit detailed description.

Ambulance for the Wounded.—The ambulance is drawn by two horses; it has one driver and two litter-bearers. Each ambulance is equipped with four litters, extra tongue and swing bars, picks and shovels for repairing the road, and six days forage for the horses. Two small water kegs are also carried and are filled with fresh water as often as practicable.

Under the driver's seat is a chest containing cooking utensils, plates, knives, forks and other tableware, a supply of beef-extract, biscuit, sugar and coffee, and the materials for five pints of soup.

Under the driver's feet is a box containing his effects, and the vacant space alongside him is arranged so as to form a kind of manger for the horses.

Medicine Wagon With Amputation Table.—The medicine wagon is provided with an operating table, which is

carried sometimes beneath the wagon, sometimes on top of it. The legs of the table fold under it and are provided with strong hinges, which make the table very firm.

The medicine wagon is often of a different pattern, without an operating table; upon removing the compartments the wagon is exactly like the large baggage wagon. This wagon is drawn by four or six horses.

In addition to these wagons, the Secretary of War authorized the use of horse and mule litters, whenever deemed necessary by the medical director. Use is also made of traveling forges, manned by a force of farriers and blacksmiths.

The wagons of each army corps constitute a large train, which is under the orders of the medical director of the corps and of the medical director of the army.

Personnel of the Ambulance Train.—The personnel of the ambulance train of an army corps consists of one captain, one first lieutenant for each division, one second lieutenant for each brigade, one sergeant for each regiment, three privates for each ambulance, and one private for each wagon. These officers and men are detailed by the commanding general of the army corps. The officers and non-commissioned officers are mounted. Both officers and enlisted men are examined by a board of medical officers belonging to the army corps, to determine their fitness for service in the ambulance corps.

The functions of the captain are purely military. He has command, under the direction of the medical director, of all the officers and men of the ambulance corps, and instructs them in their duties. He makes reports, from time to time, as may be required by the Secretary of War, the medical director, or the commander of the army corps; but any report to higher authority than

the commanding officer of the army corps, must be transmitted through the medical director of the army to which the corps belongs.

Each first lieutenant, assigned to the ambulance corps for a division, has control of that section of the ambulance train, and acts as quartermaster for it. He receipts and is responsible for all property pertaining to that portion of the train, and has authority to draw supplies from the depot quartermaster, upon requisitions approved by the captain of his corps, the medical director and the commander of the army corps. It is his duty to exercise a constant supervision over his train in every particular, and keep it at all times ready for service. He is provided with a traveling forge, and has under his orders, a blacksmith and saddler, to enable him to keep his train in order.

Each second lieutenant has charge of the portion of the ambulance corps for a brigade, and exercises a careful supervision over the sergeants and privates assigned to his portion of the train. The entire train is inspected every Sunday by the captain commanding it.

Nothing in these regulations is, however, to be construed as impairing or diminishing the authority of the commander of the army over the medical directors, officers, non-commissioned officers and privates serving with the ambulance trains.

No other persons than those named are permitted to accompany the train. Any officer who uses an ambulance, or requires it to be used for any other purpose than that for which it is intended, is, for a first offense, publicly reprimanded by the commander of the army corps with which he is serving, and for the second offense, is dismissed from the service.

Use of the Train During Battle.—The following description shows the manner in which the ambulance train of the Fifth Corps, commanded by General Warren, was employed during the battles incident to the capture of the Weldon Railroad. The medical director of this corps, Surgeon Millot, was educated in France.

The field hospital was established about three miles in rear of the line of battle. Here were assembled the medicine wagons and four large wagons, containing one thousand one hundred rations, tentage, shirts and other supplies. The medical director exercised supreme command.

The field hospital was composed of the same number of sections as there were divisions in the corps. Each section was commanded by the chief medical officer of a division. A regimental surgeon was detailed to act as chief medical officer, if the staff of the division did not include such an officer. To each section, a medical officer was attached to perform the duties of quartermaster, and supervise the setting up of the tents. A medical officer was also attached to take charge of the records. Each divisional section was subdivided into portions for each brigade. In each brigade section, the senior regimental surgeon had charge of the medicine wagon, issued all medicines and made the required reports. One of the most skilful regimental surgeons was detailed as operating surgeon. There were also two assistant surgeons and a hospital steward, whose duties were to assist at the operating table, and to enter the cases in the register. All bands belonging to the corps were assembled near the hospital and played continually.

The remainder of the surgeons were on the battlefield, where they took advantage of any shelter to form small depots, immediately in rear of which the ambu-

lances were stationed. The litter bearers brought the wounded to these depots, where they received only such treatment as was urgently required. It was forbidden to perform any operation, unless the case absolutely demanded prompt action. The wounded were refreshed with water or soup, and were conveyed in the ambulances to the field hospital.

Upon arrival at the hospital, those patients in whose cases amputation was necessary, were immediately placed under the influence of chloroform and operated upon. When they returned to consciousness, they found themselves well bandaged, lying in good beds and surrounded by every possible comfort. So great was the contrast of the quietness and comfort of the hospital with the tumult and suffering which they had so recently experienced, that many of the patients were in surprisingly good spirits.

All the wounded were not, however, equally fortunate. Those who fell separately, in places where they were not discovered, crawled either to the first-aid stations or to the hospital wagons; the way was marked by small red flags placed at intervals.

In the evening began the work of removing such of the wounded as could be removed, from the field hospital to the permanent hospital at City Point. From this point, they were, as soon as possible, conveyed in steamboats especially fitted for such service, to the great hospitals at Washington, Philadelphia, Baltimore and other places.

Administration of Field Hospitals.—The administration of the field hospitals of an army corps, is controlled by the medical director of the corps. It is based upon the same principles as that of the permanent hospitals.

An allowance is made of twenty-nine cents per man per day. This amount must cover the requisitions made by

the surgeon upon the quartermaster, commissary and purveyor, and such direct purchases as he may make. The medical director of the army has general control of all matters of administration. It will be readily seen that the hospital of an army corps can not always keep within its allowances; some have credits, others are in arrears. The medical director of the army orders transfers of funds from the former class to the latter, in the same manner as the minister of war in France controls the funds of the regiments.

THE SANITARY COMMISSION.

The liberality of administration and the good organization of the medical service, have not been considered by the women of America, sufficient reason for withholding their charity. An immense association, called the Sanitary Commission, has been organized for the purpose of relieving the hardships of war.

This society was organized June 9, 1861, and is directed by women. Its numerous agents are found in the hospitals, with the armies, and even on the field of battle. It employs a great number of persons, and uses a vast quantity of material, of wagons for the wounded in addition to those belonging to the army, of vessels for the transport of the sick, and immense supplies of food, which it distributes to supplement the allowances made by the government. Issues are made of pickled onions, oranges, condensed milk, and other articles which reach the army every Sunday. Delicacies are also furnished the sick in the hospitals and convalescent camps.

Distributions to the Wounded After the Battle of Chattanooga.—The following are some figures, taken at random from the list of articles distributed on the battle-field of Chattanooga, October 1st, 1863. These supplies

were issued from the depot of the Sanitary Commission at Nashville: 100 blankets, 601 pillows, 570 waistcoats, 6,923 pairs of drawers, 13,611 shirts, 4,087 pairs of shoes, 11,391 handkerchiefs, 9,003 books and pamphlets, 4,768 pounds of compresses, 900 gallons of cider, 6,201 pounds of beef extract, 4,597 pounds of biscuit, 8,195 pounds of dried fruit, 8,419 pounds of condensed milk, 1,425 bottles of whiskey, 1,122 bottles of wine, etc. The issue of books and pamphlets is characteristic of America.

The members of the commission sometimes act of their own accord. We saw, at the time of the arrival at the hospitals in Washington of the wounded from the battle of the Wilderness, women and girls of the Commission, belonging to the first families of the city, hurrying to meet those unfortunates, who were exhausted from a journey made under a burning sun. These ladies were accompanied by wagons filled with refreshments, ices and delicacies; and when the wounded, with wounds dressed, had been well rested in their good beds, these ladies remained at their bedsides, to serve as amanuenses for such of them as wished to write letters to their families.

Nurses.—The Commission also sends nurses to the hospitals; it pays them and controls their services. An order, dated October 19, 1864, regulates this matter. Each nurse is appointed by Miss Dix, president of the Commission, and receives a certificate from the medical director of the department. Upon her arrival at the hospital, her duties are assigned her by the surgeon-in-charge, who is forbidden to receive more than one such nurse for each thirty beds. The nurses are under the special direction of the senior surgeon in the hospital. If a nurse is found to be unfit for her position or insubordinate, she may be discharged; a notice of such action is sent to Miss Dix.

Subscriptions.—The expenses of the Commission are defrayed by voluntary subscriptions and the receipts from fairs held in the large cities. The fair at Philadelphia produced a net profit of one million dollars, and that at New York, three times that amount. The expenses of the Commission, from June 9, 1861, to February, 1864, amounted to $10,494,128.28.

Other Benevolent Societies.—It might well be thought that the charity of the American people would be exhausted by these immense sacrifices; on the contrary, other societies, principally religious, also assist in the same charitable work. During the period above described, the expenses of these societies were $13,550,737.68. Adding this sum to the expenses of the Sanitary Commission, we find that the total amount of the voluntary contributions for the relief of the army during the first three years of the war, was $24,044,865.96.

THE MILITARY ACADEMY AT WEST POINT.

HISTORICAL SKETCH.

Origin of the Academy.—In its original form, the Military Academy at West Point consisted of the body of cadets attached to the engineers and intended for the recruitment of that corps. For this reason, the academy formed an integral part of the engineer corps and was under its general direction. But, before becoming such a military school as it now is, it had to undergo many attacks, principally from the Democratic party, which regarded its creation as unconstitutional and was sustained by a large portion of the people.

The idea of a military school arose immediately after the War of the Revolution. Washington favored its establishment, but Jefferson, the leader of the Democratic party, opposed it; at a later period he somewhat favored the maintenance of the academy.

First Establishment of the Engineer Cadets.—In 1798, Congress authorized the appointment of fifty-six cadets, who were to be instructed by the engineer officers, stationed at West Point.*

*"An Act of Congress, passed May 7th, 1794, provided for a Corps of Artillerists and Engineers, to consist of four battalions, to each of which eight cadets were to be attached, and authorized the Secretary of War to procure, at the public expense, the necessary books, instruments and apparatus for the use and benefit of said corps. In 1798, an additional regiment of Artillerists and Engineers was raised, increasing the number of cadets to fifty-six." Barnard's Military Systems and Education, page 833.

Project of Secretary McHenry.—In a message in 1800, the Secretary of War, Mr. McHenry, proposed the establishment of a great institution of military education, to consist of a preparatory school and four special schools for engineers, artillery, cavalry and infantry. This proposition had no result.

Establishment of the Artillery Cadets.—In 1802, the engineers and artillery were separated into two corps; six cadets were attached to the artillery and ten to the engineers.* The senior officer of engineers was the superintendent, and in the following year teachers in French and drawing were appointed.

Precarious Condition of the School in 1808.—Such was the precarious condition of the school, that, in 1802, its course of instruction was disorganized by the departure of two officers.

The major of engineers was the instructor in the course of fortification, a captain of artillery in that of geometry, another in that of algebra; of these officers, the first was discharged and the second was sent to the West, as chief of the topographical service of the United States.

The number of cadets was, however, increased at the same time to one hundred and fifty-six.

Creation of Professorships in 1812.—In 1812, the course of instruction received a new impulse by the appointment of professors of philosophy, mathematics and

* "It was on the 16th of March, 1802, in the early administration of Mr. Jefferson, that Congress established, by that name, the *Military Academy*. It was still made part of an army corps; the idea of making a separate institution for scientific studies not being yet matured. The Artillerists and Engineers were made two distinct corps, of which there were forty cadets of artillery and ten of engineers." Ibid, page 723.

engineering, each having an assistant. A course of study of the Spanish language was organized; and a course of practical instruction in the service of ordnance. The chaplain was made instructor of history, geography and ethics. The cadets, numbering two hundred, were subjected to an obligatory entrance examination. They were assignable, upon graduation, to the four arms—engineers, artillery, cavalry and infantry. Moreover, the prejudice against the academy continued to diminish; the effective strength of the army having been reduced, in 1815, to 10,000 men, and in 1821, to 6,000, the necessity was felt of forming a reserve of well-instructed officers.

President Monroe, repeating the assertions of Mr. Madison in 1815, said in his message in 1822, that it was important to maintain at West Point, a large number of cadets, who, even if they did not enter the army, would, upon returning to their States, spread amongst the militia the germs of a good military education.

In 1815, the Secretary of War was given authority to appoint the superintendent; the inspection of the school was still vested in the colonel of engineers, who, owing to the increase of the duties of his corps, was no longer stationed at West Point.

The Administration of Major Thayer.—In 1817, the Military Academy became, at last, a military school of the highest order. Major Sylvanus Thayer was appointed superintendent. He had been a cadet at West Point, had served with distinction during the War of 1812, and had traveled in Europe, carefully studying the military schools.

He completely organized West Point, both as to discipline and curriculum, established fixed periods for examinations for admission and graduation, and made rules

concerning the duration of leaves of absence. He instituted the system of placing the cadets for two months of the year in a military camp. The length of the course of study was four years. From this period, the academy has steadily advanced; it has received successively, for purposes of instruction, companies of cavalry, artillery and sappers.

In 1846, the War with Mexico, in which the generals of the volunteer army, drawn from civil life, found themselves compelled to appoint graduates on their staffs, gave a real prestige to the academy. Members of Congress were designated to inspect it annually.

In 1858, the appointment of the superintendent was vested in the President; the officer, so appointed, was given the rank and pay of a colonel of engineers. The commandant of cadets was given the rank and pay of a lieutenant colonel, and was charged with the special direction, under the orders of the superintendent, of the course of military instruction.

In the list of those who have filled the office of superintendent, we find names that are to-day historic: Lee, Delafield, Bernard, Beauregard.

Influence of the Events of 1861.—The events of the year 1861, struck a severe blow at the academy, which it, however, withstood. Of the 278 cadets present, 86 belonged to the Southern States; 65 of these resigned, only 21 remained faithful to their oaths.

Congress was aroused at this state of affairs and, in 1861 and 1862, modified the form of the oath so as to give it a more precise meaning, such as to remove any doubt of the value of State rights, as against those of the Union. The cadets were required to take this new oath.

Number of Graduates Engaged in Secession.—The loyalty of the academy appears clearly, however, from the following figures; but the excited condition of the people, resulting from the course of events, was such that public opinion, at the beginning of the war, was distinctly hostile to the academy. The number of graduates in service at the time of Secession was 953; of these, 642 were born in free States, 311 in slave States. Of the former, nineteen tendered their resignations; fifteen to enter the Confederate army, four to return to their homes, preferring to remain neutral in the struggle, yet sympathizing with the South. Of those born in slave States, only 178 joined the Southern army; 133 remained loyal to the flag, which they had sworn to uphold. The loyalty of the academy is proven, notwithstanding its detractors, by a majority of 756 out of 953.

Another effect of secession was to reduce the number of cadets, the seceded States no longer sending their quotas. Various propositions have been made without result, to fill the vacancies by giving the power of appointing candidates to the President or to the Senators from loyal States.

During the later period of the history of the academy, the only fact worthy of mention is the return, in 1861, to a four years' course of instruction; a five years' course had been adopted in 1858.

DESCRIPTION OF THE ACADEMY.

Location.—The Military Academy, at West Point, is situated on the bank of the Hudson River, in the State of New York, in the midst of a country of surpassing beauty.

The buildings occupy a tract of forty-one and one-half acres; there are no enclosing fences, roads and land-

marks indicate the limits, beyond which cadets are not permitted to go. A target-range, a manoeuvering ground and several batteries are outside of this tract, which contains, in addition, everything needful for military instruction.

Condition of the Buildings. Cadet Barrack. The cadet barrack is a large three-story stone building, of the Elizabethan style of architecture. It is 328 feet long and 60 feet wide, with one wing, 100 feet long and 60 feet wide, at the western extremity. It contains 176 rooms, of which 136 are cadet quarters, 14 feet by 22 feet, arranged in eight divisions, having interior communications. Each room is occupied by two cadets, is well lighted, has a fire-place, and, although furnished with strict simplicity, contains all that is necessary for health and comfort.

The basement contains a number of bath-rooms, and a steam-heating plant. The cadets are required to bathe at least twice a week; the bath is an important factor in American hygiene. Above the sally-port is a large hall. The west tower is used as quarters for officers.

Mess Hall.—The mess hall, constructed in the same style, is 170 feet long and 58.75 feet wide. The dining hall is very large, 96 feet by 46 feet, and 20 feet high. The offices of the purveyor are on the left; on the right, is the officers' mess room. A wing, in rear, contains the kitchen and laundry; the basement is used as quarters for the servants.

Observatory and Library.—The observatory and library, constructed in the same style, is 160 feet long and 80 feet wide. It is a large rectangular building, with towers at the angles, and a tower in the center of the facade, surmounted by a high cupola. It contains a library, 40 feet square and 30 feet high, containing 20,000 volumes. On

the first floor, in the west wing, are the offices of the superintendent, adjutant, quartermaster and treasurer; on the second floor, are a lecture room and a philosophical laboratory.

The equatorial telescope, is beneath the cupola, in a room 27 feet in diameter. The instruments for measuring the altitude of stars, are in the north-east tower; the mural circle is in the north-west tower.

Academic Building.—The academic building is a three-story building, 275 feet long and 75 feet wide. On the first floor, to the left, is a chemical laboratory, a lecture-room, room for electrical experiments, and a work-room. Each of these rooms is 36 feet square. To the right is a fencing-hall, 75 feet long and 38 feet wide; in the center are a gymnasium and a court-martial room. On the second floor, above the chemical laboratory, is a collection of minerals and fossils; above the fencing-hall is the engineering department, comprising two model rooms, 48 feet by 22 feet; seven other rooms, each 34 feet by 22 feet, are used as recitation rooms. On the third floor are a mineralogical collection, an artillery museum, 75 feet by 38 feet, a room for recitation in mineralogy and geography, and a mathematical model room. Above the engineering department, is a drawing academy, adjoining which is a gallery of pictures and statues, 74 feet by 22 feet. There are also three examination rooms, at the north-west end of the building, and a tower with a clock.

Laboratory.—The laboratory for artillery and ordnance, comprises three two-story, stone buildings and a shed for siege artillery.

Other Buildings.—The other buildings are:

A riding-hall, a covered building, 212 feet by 78 feet.

A stable, on the river bank, 300 feet by 38 feet, with a wing, 110 feet by 38 feet. The stable contains 100 stalls.

A pontoon-shed, 154 feet by 54 feet.

A powder-magazine, 100 feet by 25 feet.

A chapel, of the Italian style of architecture of the eighteenth century, 73 feet by 54 feet.

Three barracks for the use of the troops employed for purposes of instruction. The cavalry barrack is 57 feet by 41 feet; the artillery barrack, 46 feet by 40 feet; the engineer barrack, 100 feet by 43 feet. These three barracks are two-story buildings and contain kitchens and all that is necessary for the comfort of the company.

A hospital, of four rooms, for enlisted men.

Lastly, a hotel of fifty-four rooms and large parlors, rented by the government to a hotel-keeper, who receives, at fixed prices, the families of cadets and the boards of visitors to the academy.

Cost of Buildings.—The cost of all these buildings shows, at the same time, their importance and the liberality of Congress toward the academy at West Point.

They cost as follows:

Barracks,	$186,000
Mess Hall,	43,187
Library,	50,216
Academy,	68,254
Stables,	20,408
Riding Hall,	22,100
Engineer Barrack,	16,500
Total,	$406,665

INTERNAL ORGANIZATION.

Board of Visitors.—A board of visitors, thirteen in number, appointed by the President from among the members of Congress, comes every year to inspect the school and make a report, which accompanies the President's message.

Inspector General.—The chief of the United States military engineers is the inspector general of the academy. All the orders of the Secretary of War pass through his office. He visits the academy at least once a year.

Staff of the School.—The school staff consists of a commandant of the school, with the title of superintendent and the rank of colonel of engineers; one captain as adjutant and quartermaster; one surgeon and an assistant surgeon; and one captain of engineers as treasurer.

Professors and Instructors of the Scientific Branches.—These comprise: One professor of civil and military engineering, with one assistant professor, a captain of engineers.

One professor of philosophy; one assistant professor, a captain of artillery; two acting assistant professors, one a captain of engineers, the other a first lieutenant of artillery.

One professor of mathematics; one assistant professor, a captain of artillery; six acting assistant professors, one captain of cavalry, one captain of engineers, one captain of infantry, one lieutenant of artillery and two cadets.

One professor of drawing with one assistant professor, a first lieutenant of infantry.

One professor of French and Spanish; one assistant professor of the French language, a captain of infantry;

three acting assistant professors for the course in French, one captain of ordnance, one lieutenant of artillery and one cadet; one assistant professor of the Spanish language, a captain of ordnance.

One professor of history, geography and ethics, who is also the chaplain; one assistant professor, a lieutenant of artillery; three acting assistant professors, one lieutenant of artillery, one lieutenant of infantry and one cadet.

One professor of chemistry, mineralogy and geology; one assistant professor, a captain of artillery; one acting assistant professor, a lieutenant of artillery.

This gives a total of 7 professors, 8 assistant professors and 15 acting assistant professors.

Military Instruction.—One major of infantry, with the temporary rank of lieutenant colonel of engineers and the title of commandant of cadets, is the chief instructor of the tactics of artillery, cavalry and infantry. He is assisted by two assistant instructors of infantry tactics, one captain and one lieutenant of infantry; one assistant instructor of cavalry tactics, a captain of cavalry; one assistant instructor of artillery tactics, a first lieutenant of artillery; one acting assistant instructor of infantry and artillery tactics, a first lieutenant of artillery; one acting assistant instructor of the tactics of the three arms, a second lieutenant of artillery; one instructor of ordnance and gunnery, a captain of ordnance; one instructor of practical military engineering, a captain of engineers; one sword-master and one teacher of music.

This gives a total of 11 military instructors: 1 lieutenant colonel, 4 captains, 3 first lieutenants, 1 second lieutenant, 1 sword-master and 1 teacher of music.

Hierarchy of the School Staff.—The following is the order of precedence of the above mentioned officers:

1. The Superintendent.

2. Professors and instructors, with the pay of field officers, according to seniority.

3. Professors and instructors, with the pay of captains, according to seniority.

4. All other officers according to seniority.

METHOD OF ADMISSION TO THE ACADEMY.

One cadet is appointed from each Congressional district and from the District of Columbia. The President also has the right to appoint, each year, ten cadets, without regard to residence within any defined district. Applications are made to the Secretary of War, who arranges the applicants according to districts; such action does not, however, confer any right of appointment or preference. When a vacancy occurs, the Representative of the particular district, recommends a candidate, who is thereupon nominated by the Secretary of War.

The candidate is required to report at West Point for examination, between the first and twentieth of June. If he is prevented from so reporting, by a sufficient cause, such as sickness, the examination is postponed until the last week in August.

Requirements for Admission.—A candidate must be over sixteen and under twenty years of age, at least five feet in height, of thoroughly sound constitution, of good moral character, unmarried, and must be able to read and write well, to write a dictation, to perform accurately the various operations of the four ground rules of arithmetic, of proportion, and of vulgar and decimal fractions. A cadet who marries is held to have resigned.

The candidate does not receive a warrant as a cadet until the month of January following, after having given proof of good conduct and aptitude. He is then required to subscribe to the following oath and engagement for service.

"I engage myself, with the consent of my parents, (or guardians) provided I am admitted into the service, to remain eight years in the army of the United States, unless sooner discharged by proper authority; and I swear that I will bear true faith and allegiance to the United States of America, that I will serve them honestly and faithfully against all their enemies, whoever they may be; that I will obey the orders of the President of the United States and of my superior officers, as required by the laws and army regulations."

In 1864, the number of cadets was 232, distributed as follows: first class, 27, second class, 71, third class 51, fourth class, 83. On the 1st of July, 1864, 51 new cadets were also admitted, who were to receive warrants in January, 1864.

THE COURSE OF INSTRUCTION.

The studies pursued at the academy are:

1. Infantry tactics and military regulations; the schools of the soldier, company and battalion, the evolutions of the line, and the manoeuvres of light infantry and riflemen.

2. Mathematics. This course comprises algebra, (to include the solution of equations of the third degree, the summation of series and the nature and use of logarithms) geometry, plane and spherical trigonometry, the use of trigonometrical tables, surveying, a thorough course in drawing of contoured maps, descriptive geome-

try, analytical geometry (conic sections, solution of equations of the second degree involving three variables, the determination of loci, etc.), differential and integral calculus with its application to maxima and minima, the drawing of tangents, etc.

3. The French language, speaking and writing correctly.

4. Topographical drawing, maps and figures with lead pencil, pen and ink, and water colors.

5. Organic chemistry, the applications of chemistry, mineralogy and geology.

6. Philosophy, the force of gravity, acoustics, optics, electricity, and the applications of these sciences. Astronomy, including the use of the instruments.

7. Practical and theoretical instruction in the manufacture and use of artillery, and in pyrotechny.

8. Cavalry tactics, comprising the schools of the trooper, platoon and squadron; and equitation.

9. Fencing and bayonet exercise.

10. Practical military engineering, including the making of gabions and fascines, the construction of platforms, batteries, parallels, and works of temporary fortification, and exercises with pontoon and other military bridges.

11. Grammar, including prosody, diction and style. Physical, political and military geography. Philosophy, rhetoric, logic and ethics. The political institutions of the United States. Civil and military law.

12. Civil and military engineering, permanent fortification, attack and defense of permanent works, temporary fortification, construction of lines of works and re-

doubts, the study of the various systems of military bridges, military administration, science of war, strategy and tactics. Architecture, bridges, roads, canals, embankments, the theory and description of mechanism and machines.

Distribution of Studies by Years and Classes.—First Year. Artillery and infantry tactics, fencing, English grammar, geography, rhetoric, French grammar and elementary mathematics.

Second Year. Infantry, artillery and cavalry tactics, the remainder of the courses in French and mathematics, and the first part of the course in drawing.

Third Year. Infantry, artillery and cavalry tactics, natural philosophy, chemistry and the remainder of the course in drawing.

Fourth Year. Theories of infantry and cavalry, cavalry tactics, fencing, practical military engineering, mineralogy and geology, philosophy, civil and military engineering and science of war.

The academic year consists of ten months. During the months of July and August the cadets are placed in camp and live a purely military life.

Division Into Classes and Sections.—The cadets are divided not only into classes, but into sections in each class, so that a professor or assistant has not more than twenty pupils. In so far as this system gives rise to increased application by the cadets, it has great advantages; but in the higher scientific branches of the course, the difference of ability of the various instructors, gives rise to great inequalities of instruction in the sections. It would evidently be better to have a single course of instruction, and to divide the class into sections only for

recitations, to be heard by the assistants; this system is, in fact, adopted in the courses of chemistry and civil and military engineering.

Relative Importance of the Courses of Study.—The importance attached to the various branches, is indicated by the following fiugres:

First Year. Mathematics, 2; grammar, geography and rhetoric, 1; French, 1; conduct, 1.

Second Year. Mathematics, 3; French, 1; drawing, 1; conduct, 1.

Third Year. Philosophy, 3; drawing, 1; chemistry, $1\frac{1}{2}$; conduct 1.

Fourth Year and Graduation. Engineering and military art, 3; philosophy, 3; mathematics, 3; conduct, 3; logic, philosophy and political science, 2; mineralogy and geology, 1; chemistry, $1\frac{1}{2}$; infantry tactics, $1\frac{1}{2}$; artillery, $1\frac{1}{2}$; drawing, 1; French, 1; grammar, geography and rhetoric, 1.

Semi-Annual Examinations. Classification of Cadets.—The relative rank of cadets in their classes and in passing from one class to another, is determined by annual and semi-annual examinations. The academic year commences on the first of January.*

At the end of the first year, the cadets, who have passed satisfactory examinations, receive, from the superintendent, diplomas of graduation, resembling the diplomas of a university, and are recommended to the Secretary of War, by the Inspector General, for commission as officers.

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*The academic year extends from July 1st to June 30th. Admissions date July 1st.

Graduation. Promotion in the Army.—The diploma confers, of itself, no right to commission. Prior to commission, which is a purely voluntary act of the executive power, the graduate must obtain a certificate from a board, consisting of the board of medical officers charged with physical examinations for admission to the academy, the superintendent and the instructors of engineering, artillery, infantry and cavalry, stating his physical aptitude and mental capacity for the military profession. On the basis of such certificates, the Secretary of War distributes the commissions of officers for the different arms.

Any cadet who resigns his warrant or who leaves the academy before the completion of the course, is debarred from commission in the army until all graduates from his class shall have been commissioned. If his departure from the academy occurred by reason of idleness or bad conduct, he cannot be commissioned until one year after all graduates of his class shall have been commissioned.

INTERNAL SYSTEM.

The system of internal government of the academy is purely military.

The Battalion.—The cadets are organized into a battalion, consisting of four companies. Each company corresponds to one of the classes of study.* The first class, or cadets in their fourth year, form the first company, and a similar rule obtains for the other classes.

The officers and non-commissioned officers are selected from the most meritorious cadets of the three higher classes. The first class furnishes the officers, the

*This is an error. The cadet companies are composed indiscriminately of the four classes.

second class the sergeants, and the third class the corporals. The duty of the adjutant is performed by daily roster.

Uniform.—The uniform is quite elegant; it is of grayish-blue color, with dark-blue braid. It consists of a dress-coat with three rows of buttons; a riding jacket; a coat to be worn during study hours; an overcoat; trousers, a dress-hat and forage-cap. There are also a vest for winter, and a linen vest for summer; but these are not obligatory. Chevons, worn upon the sleeve, are used to mark the grades of cadet officers. The buttons are an inch in diameter and are inscribed U. S. M. A.—United States Military Academy.

Pay of Cadets.—The cadets receive pay, but the amount has often varied. In 1802, it was sixteen dollars per month and two rations. In 1857, the rations were cut off and the pay increased to twenty-four dollars. In 1857, the pay was again increased to thirty-two dollars, and it is again proposed to further increase it.

Two dollars per month of the pay of a cadet are retained, to provide a fund, with which the necessary equipment may be purchased upon graduation. The remaining thirty dollars are used in paying for the board and equipment of the cadet; his first equipment is furnished by the government without cost.

The cadet is never furnished with money. Everything is furnished him upon written requisition and charged to his account; notwithstanding these precautions many cadets are in arrears at the time of graduation. In 1863, the greatest debt of any cadet was ninety-six dollars; the greatest credit was twenty dollars and sixty-four cents. It has, however, been found that those cadets who had amounts to their credit, have been assisted by their fam-

ilies, who, although forbidden to furnish the cadet any money, may, through the military channels, furnish certain articles of underwear and shoes.

In view of the increase in cost of all commodities, it is proposed to increase the pay to twenty dollars per month and two rations, each ration being valued at nine dollars per month; the total monthly pay would then be thirty-eight dollars.

Care of Effects and Rooms.—Each cadet is required to take care of his clothing and shoes; the care of the rooms is the duty of orderlies or servants, under strict regulations.

Court-Martial.—The discipline is severe but not excessive. There is a permanent court-martial for the trial of grave offenses.

Discipline.—The offenses punishable by dismissal from the academy, are almost all designated in the regulations. Absence without leave, absence from quarters during the hours intended for sleep, any immoral conduct, and going beyond cadet limits are so punishable. The use of tobacco is forbidden.

Temperance Society.—Drunkenness is carefully repressed. The use of intoxicating liquors is a national vice. The regulations in this matter are powerfully aided by the sentiment of the cadets. A society has been formed, each member of which engages himself under oath not to drink any liquor during his stay at the academy. Each member is bound to denounce any member who violates his oath. But one such denunciation occurred in 1863, and it was ascertained that the liquor, which was found in the room of the accused cadet, had been brought there only by authority of the surgeon.

Explanations of Offenses.—Cadets are authorized to submit, in writing, to the superintendent, in prescribed form and at designated hours, explanations for offenses or pleas for suspension of punishment. A cadet is forbidden to address the superior who has reported him.

Classification of Offenses.—Offenses are graded, each having its co-efficient. They are divided into eight classes, the first being recorded by ten demerits, the eighth by one. When the total number of demerits of a cadet reaches two hundred, he is dismissed.

Dismissal.—A cadet may be dismissed for bad conduct, idleness, or an offense so punishable by the regulations, or by sentence of a general court-martial. In the first case he is permitted to tender his resignation; in the second, he is publicly dismissed. He can not then, upon any pretext, re-enter the academy.

Employment of Time.—The hours of work, recreation and repose, are regulated intelligently. The following schedule shows the arrangement of hours for the various classes:

Reveillé roll-call is followed by cleaning of arms, clothing, etc., and study. An inspection of quarters is made thirty minutes after reveillé. Breakfast is at seven o'clock, guard-mounting at half past seven, class parade at eight o'clock. The intervening time may be used for recreation.

The hours from eight o'clock to one o'clock in the afternoon are recitation and study hours. Between eight o'clock and eleven o'clock, recitations are made by the first class in civil and military engineering and engineering drawing; by the second class, in natural philosophy; by the third class, in mathematics; and by the fourth class, in mathematics. Between eleven o'clock and one

o'clock, the first class is engaged in cavalry exercises and fencing; the second class, in chemistry and cavalry exercises; the third class, in French; the fourth class, in grammar, French and fencing. Time not devoted to recitation is used for study.

Dinner is at one o'clock; class parade at two o'clock. the intervening time is devoted to recreation.

The hours from two o'clock until four o'clock are recitation and study hours, and are used by the first class, in the courses of ethics, mineralogy and geology, and cavalry and artillery tactics; by the second class, in drawing; by the third class, in drawing and cavalry exercises; by the fourth class, in grammar and French.

The time between four o'clock and sunset is devoted to drill, recreation and the evening parade. Supper is immediately after parade; evening call to quarters, thirty minutes after return from supper, the interval being used for recreation.

The time from call to quarters until nine o'clock, is devoted to study. Tattoo roll-call is at nine o'clock; lights are put out and quarters inspected at ten o'clock.

Results of the Academy.—It can not be denied that the West Point military academy has trained very eminent men; of this, the present war, conducted on both sides by its graduates, furnishes conclusive proof. The great work of the topographical survey of the lakes, the construction of the Union fortifications, of lighthouses, and the great levees of the Mississippi, the work of the engineer corps, prove the excellence of the scientific instruction of the academy. Comparision with the systems of instruction of the military schools of France, leads to the following conclusions:

The mathematical course is less thorough than that of the Polytechnic School, but much superior to that of Saint Cyr.

Geography and military history are much less studied than at Saint Cyr, but military art, physics, engineering and artillery are more thoroughly taught.

The courses of permanent fortification and artillery can not be compared with those of Metz, but are equal to those of the Staff School.

The construction of batteries, the use of gabions and fascines, geodesy and topography are more completely taught at Metz and the Staff School.

The purely military education, comprising the tactics of infantry, artillery and cavalry, and equitation, is as thorough at West Point as at Saint Cyr, the Staff School or the School at Metz.

Philosophy, the study of the political organization of the United States, civil and military law, are studies of which the Staff School alone furnishes kindred examples.

Project for Reorganization.—The academy is, however, menaced with a reorganization, one of the causes of which is an unfortunate desire to imitate European systems.

A special school is always affected by the general state of instruction of the country in which it is. It is quite certain that the requirements for admission to West Point are no longer in accord with the diffusion of instruction in the United States. But, although primary instruction is quite advanced and wide spread, and although higher instruction in universities, such as Harvard, is equal to that of the most advanced states of Europe, the same is not at all true of secondary instruction, which is

quite deficient in American society. This fact has perhaps escaped the very earnest and disinterested patriotism of the reformers.

It has been remarked that, of the 4,626 cadets who have entered West Point since its establishment, 2,398 were unable to graduate, and that, of the latter number, more than three-fifths failed to pass the examinations at the end of the first year; although these examinations are hardly more severe than those which must be passed before admission to a military school in Europe.

Moreover, the present method of selection of candidates has appeared to remove any cause for emulation, and it has been thought that a system of admission, based upon public examinations, would give a decided impetus to study throughout the country, and excite among the young men talents which are not exhibited at present.

Project Submitted to Congress.—Without entering into discussion of its provisions, we will make report of a project, submitted to Congress in 1863, which, sooner or later, will probably serve as a basis for the reorganization of West Point.

1. The Corps of Cadets shall consist of four hundred members. Each State and Territory shall be entitled to a number equal to its representation in Congress. The remainder shall be designated by the President from the country at large, and he shall also fill any vacancies which may remain unfilled for three months after the annual examinations.

2. In each State and Territory, boards of examiners will meet in such places and at such times as Congress shall prescribe, and shall publicly examine such candidates as may furnish proof that they have for two years been

preparing themselves for admission to the Academy. The examiners shall make return under oath to the Secretary of War, of the persons examined, in the order of merit. All appointments to fill vacancies for any State or Territory, or for the country at large, shall be made in the order of merit as shown from these returns.

3. No person shall be considered a suitable candidate unless he shall be over seventeen and under twenty-one years of age; shall possess an unblemished moral character and correct personal habits; shall be in good health and possess a physical constitution suitable for the military service.

4. Shall have received a good English education, which shall embrace the correct use of the English language in speaking and writing, a knowledge of drawing, the ability to perform readily the various operations of arithmetic, a knowledge of the elementary principles of algebra and geometry, and a thorough knowledge of the geography, history and Constitution of the United States and of the State of his residence.

5. Shall make a written declaration of his desire to enter the military service, with an engagement to remain therein for a period of at least sixteen years from the date of his appointment as a cadet, and finally shall make oath that he will bear true faith and allegiance to the Constitution and government of the United States, against all enemies, foreign and domestic, and paramount to all obligations to any State government, authority or constitution.

THE ORDNANCE DEPARTMENT.

The Ordnance Department has charge of the arsenals and armories and furnishes all ordnance and ordnance stores used by the armies.

Ordnance and Ordnance Stores.—Under this heading are comprised: cannon, artillery carriages, artillery implements, machines and equipments, small-arms, accoutrements of infantry and cavalry, horse equipments, ammunition, tools of various kinds, veterinary instruments and supplies, materials for horseshoeing and harness.

Personnel.—The Ordnance Corps consists of 1 brigadier general, chief of ordnance, 2 colonels, 3 lieutenant colonels, 6 majors, 20 captains, 12 first lieutenants, 15 second lieutenants; a total of 59 commissioned officers. There are, in addition, a number of ordnance storekeepers. During the war the number of officers was increased to 68, and this small number of officers was found sufficient, notwithstanding the immense requirements of a great war.

Instruction and Promotion of Officers.—The officers of the corps are fully capable of discharging the duties of the important service with which the corps is charged. Promotion is made by seniority in the same manner as in the Engineer Corps; an officer, before being promoted, is

required to pass a satisfactory examination. A candidate who fails is suspended from promotion for one year; a second failure entails discharge from the army.

The officers of the corps are appointed from the graduates of the Military Academy. No portion of the Ordnance Corps pertains to the volunteer army.

The following are the requirements for promotion to the different grades, as prescribed by the order of December 9, 1863:

Examination for Second Lieutenant.—The candidate must be perfectly familiar with the following subjects: arithmetic; algebra; plane, descriptive and analytical geometry; trigonometry; surveying; elements of calculus; physical and political geography; English grammar and composition; outlines of national and military history. Natural and experimental philosophy, including mechanics, optics, astronomy and electrics; the elements of chemistry; linear and topographical drawing and use of drawing instruments. The principles of ordnance and gunnery; elements of mineralogy and geology; elements of civil engineering, especially those relating to building materials and strength of materials. Elements of field fortification; the Constitution of the United States; Rules and Articles of War and law of February 8, 1815, organizing the Ordnance Department. Tactics, including the schools of the soldier and company; of the squadron and battery.

For First Lieutenant.—He must be perfectly conversant with all that is required for a second lieutenant, and, in addition thereto, with the following subjects: elements of permanent fortification; theory and practice of the steam engine; general principles of architecture; familiar knowledge of all woods and metals used in ord-

nance construction, with the processes of reducing the ores of all metals which enter into the fabrication of ordnance stores. The General Regulations of the Army and of the Ordnance Department; all laws, relating to the Ordnance Department since its organization; military law, and the practice of courts-martial; Kent's Commentaries; Thackeray's Army Organization and Administration. Infantry, cavalry and artillery tactics.

He must be thoroughly acquainted with the resources and business of all the arsenals at which he may have been stationed, as regards the kind of ordnance stores made at each, their capacity for manufacturing, the cost of labor and material as compared with each other, and their advantages and disadvantages, in a geographical and military point of view, for the business carried on at each.

He must be perfectly familiar with the method of enlisting, mustering, paying and discharging soldiers; of receiving and issuing all ordnance stores; of making all monthly returns to the Adjutant General, the Treasury, and the Ordnance; of making quarterly and annual papers of all kinds; in short, the whole method of administration in force at each post.

A thorough acquaintance with the duties and responsibilities of an assistant quartermaster, or an assistant commissary, and all the duties of the various positions of an officer of the Ordnance Department.

For a Captain.—In addition to all required of a lieutenant: the methods of working iron and iron ores, the manufacture of gun-metal, and the casting of cannon; history of the experiments made by the Ordnance Department on this subject. Method of making steel and bronze, and of reducing lead, zinc and tin ores; and all the necessary furnaces and fixtures used in the processes.

A thorough acquaintance with all the machines in use at all the arsenals, armories and foundries; with all the details of manufacture and subsequent critical inspection of cannon, with all the implements, equipments, harness, carriages and projectiles required for their use; with all the varieties of small-arms used in the service, with the requisite ammunition pertaining to each; all accoutrements and horse equipments, and all general machines for the use of artillery in field or garrison.

All general orders from the Adjutant General's office, up to the date of examination; all circulars bearing on the duties of an ordnance officer; a perfect knowledge of all the administrative duties of the Ordnance Office, in relation to other bureaus of the War Department, and a full acquaintance with the method of conducting the business of each division of that office. Theory of the duties of an ordnance officer at the headquarters of an army or department; practical duties of an ordnance officer in charge of a depot in the field. History of the Ordnance Department from its first organization to the present time.

Importance of the Service.—The necessity for such varied knowledge will be understood when one reflects upon the small number of officers, to whom is entrusted an immense service, involving continued money accountability, whose most important branches, such as the direction of a great arsenal, are sometimes confided to a mere captain.

Clerks.—A numerous force of clerks is attached to the Ordnance Department, but for which fact it would have been insufficient for the requirements of the present war. This force comprises 6 clerks at $1,800 per year, 9 at $1,600, 15 at $1,400, 100 at $1,200 or $1,000; 3 printers at $2 per day and 7 messengers at $840 per year.

Arsenals.—The number of arsenals, foundries and armories in the United States is twenty-eight, including the establishments at Columbus, Benicia, Indianapolis and in Rhode Island, which have been recently constructed. The seven really important arsenals which have continued in operation during the war are:

NAME AND CITY.	Number of Men Employed.	MOTIVE FORCE.
Watertown (Boston).....	1200	200 horse power
Watervliet (Troy, N. Y.).....	800	90 "
Washington, D. C.....	800	25 "
Bridgeburg (Philadelphia).....	1200	25 "
Saint Louis, Mo.....	600	45 "
Alleghany (Pittsburg).....	400	60 "
Fortress Monroe, Va.....	200	45 "
Total.....	5200	490 horse power

All these arsenals are remarkable because of their situation upon railroads or navigable water-ways, their size, the arrangement of their buildings and their prevailing good order and discipline. For all structures exposed to explosion, there has been adopted a very interesting system of construction, using boards upon an iron framework, which can not be too strongly recommended.

Steam is generally used as the motive power; at Watervliet Arsenal, however, use is made of three turbines, which can, if necessary, be replaced by steam power. At each arsenal there are store-houses, magazines, and shops for the repair of all kinds of material. In addition, each arsenal is devoted to a special work. Iron gun-carriages are manufactured only at Fortress Monroe and Watertown; wooden carriages principally at Watertown, Watervliet, Alleghany and Washington.

Harness is made at Watertown and Watervliet. The principal repair shops, especially for small-arms, are at Saint Louis and Washington. Compressed bullets are made in the arsenals at Saint Louis, Washington and Alleghany; a great number were also furnished by private factories.

Ammunition is prepared at all the arsenals except that at Fortress Monroe. The arsenals at Saint Louis and Fortress Monroe owe their development to the presence of the armies of the West and East respectively.

The machinery is excellent and is quite equal to the equipment of the great industrial establishments of the country; the wages of manual labor are so high that the use of machinery is an absolute necessity. A technical description of all these establishments and of their machinery is given in the fourth part of this report.

The distribution of the work is intelligently made according to true industrial principles; the output is therefore nearly the maximum possible. Watervliet furnishes 150,000 cartridges per day; Saint Louis and Washington each furnish 35,000. At Watertown there are made each week two iron carriages for pieces of fifteen to twenty inches calibre, seven for pieces of eight and nine inches calibre, and seven mortar carriages. The product of a single machine is sometimes wonderful; a single workman can make 180 wheel spokes in a single day.

Foundries.—Cast iron guns are made in the foundries at Pittsburg, Reading, Cold Spring, South Boston and Providence.

The systems generally adopted are those of casting in metal moulds and, for large calibre guns, casting on a

core with interior cooling by means of a cold water current.

The foundry at Fort Pitt, Pittsburg, is the most important. The casting room contains twenty-three casting pits, of which one is for twenty inch guns and seven for fifteen inch guns. It contains also seven reverberatory furnaces, one with a capacity of fifty tons and two of twenty-five tons. There are also six steam cranes, two of which have a power of forty tons. The boring-room contains thirty-one lathes.

Owing to the use of steam these massive machines work, and these enormous weights are moved almost automatically; a visitor discovers not more than eight or ten workmen wandering as if lost in these immense workshops.

Large projectiles are also manufactured at Fort Pitt. This entire establishment employs only two hundred mechanics and laborers, and yet furnished to the navy, during the year 1864, more than six hundred nine-inch guns.

Foundry at Cold Spring.—The foundry at Cold Spring, situated near the Military Academy at West Point, is managed by Mr. Parrott himself; it produces the pieces, carriages, projectiles and fuses of the system which bears his name. The process of shrinking on the bands, used to strengthen the pieces, merits special attention. Special mention must also be made of a machine by means of which cylindro-ogival projectiles are brought to exactly identical sizes.

The cost of the product of these foundries depends necessarily on the calibres and not on the weights of the projectiles. A fifteen-inch Rodman gun, firing a spherical projectile of 320 pounds weight, costs $7,000. A Parrott

rifled gun, firing a cylindro-conical projectile of 300 pounds weight, costs only $4,700.

Bronze pieces are usually furnished by private foundries. Their manufacture is in no way remarkable.

Armories.—The only armory belonging to the government is that at Springfield, which has been created since the beginning of the war; it has an output of one thousand muskets per day.

All the work is done by machine and the various parts are so perfect and so nearly alike that a musket can be assembled without need of adjustment of any of its parts.

Private factories, by adopting the same methods and the same models, furnish an equal number of muskets of the same quality.

The annual production of muskets is therefore more than 700,000. To this must be added at least 300,000 revolvers and pistols.

At the end of the war the Ordnance Department recommended the adoption of a breech-loading rifle, but, instead of seeking a new model, the President has recommended that the old arms be converted into breech-loaders, and that the manufacture of entirely new weapons be not begun until experience has determined conclusively what small-arm is the best. Numerous tests have been made of various systems of conversion; the system of General Robert appears to be most satisfactory in loading, firing and ease of conversion.

Another branch of manufacture pertaining to the Ordnance Department is that of horseshoes. These are made in the factory of Mr. Burden at Troy, by machinery alone. A bar of iron, raised to a cherry-red heat, is

seized, bent and cut, one might say instantaneously. Six machines each furnish sixty shoes per minute. These shoes are furnished at the usual retail price of iron. There are six numbers from which the farrier can choose; only the branches need fitting. The nails are manufactured in a similar manner.

Powder is furnished by private manufacture; the Ordnance Department is, therefore, charged only with the duty of making the necessary proof upon its receipt. There are in the United States, two great powder factories; that of Dupont Brothers, at Brandywine, and that of Mr. Hazard, at Hazardville. These two establishments have abundantly provided for all the requirements of the war.

In order to appreciate the extent and value of the services performed by the officers of the Ordnance Department, during the strain of such an enormous production of material, it must not be forgotten that the government, whose arsenals had been despoiled through the treason of the last Secretary of War, during the administration of President Buchanan, was obliged to make use of all the refuse arms which it could obtain in Europe, in order to oppose the first efforts of the rebellion.

The purchase of arms abroad did not cease until 1863. At this time the private manufactories of Pennsylvania had succeeded in furnishing, for the War Department, iron equal in quality to that obtainable in England or Sweden.

By means of the following table an idea may be obtained of the resources of the arsenals and of the quantities of material of all kinds manufactured during one year of the war. This table shows the receipts, issues, and quantities remaining on hand in store during the year 1862-63. It does not include repair of arms and enginery,

sent to the repair shops from the army and subsequently returned:

	RECEIVED.	ISSUED.	ON HAND.
Field guns, various calibres.....	1,126	1,108	484
Siege guns.....	335	288	249
Sea-coast guns.....	116	41	679
Projectiles, field.....	1,099,622	699,217	474,515
Projectiles, siege.....	106,426	156,000	234,893
Projectiles, sea-coast.....	45,947	84,530	471,341
Artillery carriages, field.....	965	1,125	359
Artillery carriages, siege.....	261	340	44
Artillery carriages, sea-coast.....	307	753	622
Mortar carriages.....	99	207	230
Caissons, forges and other wagons	871	1,040	517
Small-arms, infantry.....	1,082,841	582,736	836,001
Small-arms, cavalry.....	282,389	291,141	124,897
Equipments, infantry, sets.....	901,667	899,006	162,010
Equipments, cavalry, sets.....	18,009	92,381	2,498
Horse equipments, cavalry, sets..	94,639	109,600	5,562
Harness, double, artillery.....	3,281	6,002	1,767
Powder, pounds.....	5,764,768	5,336,765	1,463,874
Saltpetre, pounds.....	.....	.....	8,195,079
Lead in bullets and ingots, pounds	48,719,862	31,139,102	23,024,025
Cartridges, artillery.....	1,435,046	1,089,863	2,274,490
Cartridges, small-arm.....	259,022,216	165,777,604	378,584,104
Percussion caps.....	347,276,400	373,192,870	715,036,470
Friction primers.....	3,925,379	3,719,740	6,082,505

The following table shows the material owned by the United States at the outbreak of war; that which was manufactured or purchased; and that which, on June 30, 1863, was in use or had been expended:

	ON HAND AT BEGINNING OF THE WAR.	PURCHASED.	MANUFACTURED.	IN SERVICE OR EXPENDED.
Guns, field	231	2,734	.....	2,401
Guns, siege	544	564	.....	841
Guns, sea-coast and mortars	1,508	418	.....	1,247
Projectiles, field	90,199	1,912,894	.....	1,528,578
Projectiles, siege	131,036	242,155	.....	138,298
Projectiles, sea-coast	142,356	407,695	.....	78,710
Carriages, field	266	1,948	637	2,492
Carriages, siege	104	154	484	698
Carriages, sea-coast	1,787	45	509	1,719
Carriages, mortar	106	97	509	207
Caissons	213	2,963	223	2,139
Traveling forges	117	348	58	431
Battery wagons	60	226	64	285
Muskets and rifles	437,433	1,622,552	327,592	1,551,576
Carbines	4,076	107,307	.....	98,118
Pistols and revolvers	27,192	230,761	.....	229,052
Sabres and swords	16,933	237,555	.....	171,817
Equipments, infantry	10,930	1,809,501	21,799	1,680,220
Equipments, cavalry	4,320	181,428	13,048	196,298
Horse equipments, cavalry	574	203,041	13,617	211,670
Harness, draft, double sets	586	15,552	3,214	17,485
Powder, pounds	1,110,584	13,424,363	.....	13,071,073
Saltpetre, pounds	2,923,348	5,231,731	.....	.....
Lead, pounds	636,966	58,211,345	.....	36,964,121
Bullets, lead, pounds	664,800	13,505,429	.....	13,090,394
Cartridges, small-arm	8,292,300	574,662,080	447,542,733	378,584,104
Cartridges, artillery	28,248	116,032	2,622,714	2,274,490
Caps	19,808,000	689,668,400	79,806,600	715,036,470
Friction primers	83,425	1,500,574	6,504,135	6,082,505

Requirements for Receipt of Stores.—Every article purchased or manufactured must conform to a pattern or model prescribed by the Chief of Ordnance. These patterns and models are kept in the arsenal at Washington. All contracts are entered into directly by the Chief of Ordnance, with the approval of the Secretary of War. Certificates of the receipt of stores are executed in triplicate and transmitted to the Ordnance bureau.

Armanent of the Militia.—The Ordnance Department also furnishes arms and equipments to the militia; the expense of this armanent is defrayed by the national government. A law, dated August 23, 1808, fixed this expense at $200,000 per year; but at that time the population was only 6,853,038, and the militia about 1,439,137. On the same basis the number of the militia would be 4,800,000, and it has therefore been found necessary to increase the annual expense to $2,000,000 until the armament of the militia is complete.

The cost of transportation within the State or from one State to another of all militia or their baggage, is also defrayed by the central government. The number of muskets is fixed for each State and Territory. For all other material of the patterns prescribed by the War Department, the governors make requisitions, which are filled as far as practicable without exceeding the limit of expense prescribed by law.

Accounts and Requisitions.—In all its accounts with the militia, the army and the branches of its own service, the Ordnance Department makes use of regular printed forms, of prescribed and uniform character. In time of peace, no stores are issued from any arsenal or armory, except by the express authority of the ordnance bureau of the War Department. In time of war, to supply

troops in service, issues may be made on the order of any general or field officer commanding an army, garrison, or detachment; immediately after making such issue, the issuing officer must transmit the order therefor to the ordnance bureau. In case of issues to the militia, the requisition must be approved by the mustering and inspecting officer.

When arms or equipments need repairs that can be made by troops, the commanding officer may order the needed repairs; in other cases the stores must be sent to the nearest arsenal.

Officers may purchase, on payment of the regulated price, such arms and equipments as they need for their own use in the public service.

Commanding officers are required to report all cases of loss or damage to arms or equipments, so that it may be determined if the soldier is responsible. Charges for such loss or damage are made at fixed rates against the pay of the soldier, if held to be responsible. The loss of the Colt's revolver is not excused, and its value is estimated at forty dollars.

Every officer commanding a regiment, corps, garrison, or detachment, is required to make, at the end of February, April, June, August, October and December, a report to the chief of ordnance, stating all cases of loss or damage. These reports must name the officer or soldier by whose negligence the damages were occasioned. If the damages were occasioned by the inferior quality of the stores, this fact must be reported, in order that necessary instructions may be sent to the arsenal or armory from which they were issued.

Inspection of Arsenals and Armories.—Armories and arsenals of construction are inspected annually; other ar-

senals are inspected every two years. The inspectors are designated by the Secretary of War; a report of each inspection is made to the ordnance bureau.

Inspections are also made of the small arms manufactured in private establishments. The inspectors procure necessary assistants from the national armories. No inspector shall make two successive inspections of the same establishment.

Interior Service of Arsenals and Armories.—The charge of an armory, in the absence of the superintendent, devolves upon the master armorer, unless the chief of ordnance shall otherwise direct. In case of an arsenal, the charge devolves on the military store-keeper.

The officer in charge of an arsenal or armory, may make, under the direction of the chief of ordnance, rules fot its internal government; procure the necessary materials and tools; engage the workmen and appoint the foremen. The cause for discharging a foreman must be reported to the ordnance bureau.

The military store-keeper performs the duties of cashier; he disburses the funds on the certificates of the officer in charge, upon each account, stating the sum total in words; he has the care and custody of all material, except that in current service, for which, including draft animals, the officer in charge is accountable. When there is no store-keeper, the commanding officer is accountable for all ordnance property, unless authorized to devolve the accountability upon another officer.

Orders for the Issue and Receipt of Supplies.—Orders for the issue of supplies from an arsenal or armory are directed to the officer in charge, who transmits them to the store-keeper and sees to their execution.

Materials to be consumed or expended, are issued on the written orders of the officer in charge to the store-keeper, who makes quarterly abstracts of such issues, to be certified by the officer in charge.

The officer in charge turns over to the store-keeper all stores received and all articles fabricated, purchased or repaired; the store-keeper makes quarterly abstracts of such receipts, to be certified by the officer in charge. At an armory, all articles purchased, fabricated, or repaired, are inspected by the master armorer before being paid for or turned into store.

Hired Men and Workmen.—Hired men in the ordnance service are engaged on daily wages, except men on piece-work. The working day consists of ten hours. All night work is separately paid for, and its necessity explained on the pay-roll.

Workmen in an armory are paid, as far as practicable, by piece-work. The price of piece-work is fixed according to the skill and labor it requires, by the officer in charge, who makes report of such action to the ordnance bureau. Report is also made of any increase of wages. The money value of any piece of work spoiled by the fault of a workman, is charged against him on the pay-roll.

A rent is charged monthly on the pay-roll to the hired men who occupy public quarters, except the master armorer and clerks. The rent-roll is returned quarterly to the ordnance bureau.

Enlisted Men.—There is a force of enlisted men of the Ordnance Department, under the direction of the chief of ordnance, who assigns them to the different establishments. They may be promoted to the grade of workman by the officer in charge; but not to the grade of

master workman, except by authority of the chief of ordnance.

Mileage.—Armory officers and hired men in the ordnance service receive ten cents mileage for travel under orders.

Draft Animals.—None but strong draft animals can be purchased for the ordnance service, nor without authority from the chief of ordnance.

Books and Records.—Upon being relieved, an officer of ordnance must turn over the following records to his successor:

1. A company return book, consisting of retained duplicates, bound together.

2. A monthly return book, containing the issues and receipts during each month.

3. A quarterly account book, containing copies of accounts-current and abstracts of money expended.

4. A letter book of copies of letters sent.

5. Files of letters received.

6. Files of orders received.

7. An annual inventory book, containing copies of preceding inventories.

8. At armories and arsenals of construction, such other books as may be necessary to show the details of the operations.

All books and papers are to be submitted to inspecting officers, when called for.

Cost of the Ordnance Service.—The cost of the ordnance service was:

In 1862-1863,	$42,313,630.21
In 1863-1864,	38,502,822.99
In 1864-1865,	43,112,531.27

Stores Furnished.—Since January 1st, 1861, the Ordnance Department has furnished the following stores to the army:

Cannon,	7,892
Artillery Wagons,	11,787
Small-Arms,	3,022,130
Cavalry and Infantry Equipments,	2,362,546
Horse Equipments for Cavalry,	539,544
Horse Equipments for Artillery,	28,164
Cartridges,	1,022,176,474
Percussion Caps,	1,220,555,435
Artillery Cartridges	2,882,177
Cast-iron Projectiles, Kilograms,*	5,802,508
Powder, Kilograms,	11,877,344
Saltpetre, "	2,887,983
Lead, "	39,333,388

It has been found that the average length of service of a cavalry carbine is five years; of pistols, sabres and cavalry equipments, four years; of infantry equipments, six years; of the infantry musket, seven years.

*A kilogram equals 2.2055 pounds avoirdupois.

THE QUARTERMASTER'S DEPARTMENT.

This department provides the quarters and transportation of the army; storage and transportation of all army supplies; army clothing; camp and garrison equipage; cavalry and artillery horses; fuel, forage and straw; material for bedding; and stationery.

It also pays incidental expenses of the army arising from the per diem of extra-duty men; postage on public service; the expenses of courts-martial, of the pursuit and apprehension of deserters, of hired escorts, of interpreters, spies and guides, of veterinary surgeons and medicines for horses, and of supplying posts with water; and generally the proper and authorized expenses for the movements and operations of an army not expressly assigned to any other department.

Personnel.—Its personnel includes 1 Quartermaster General, with the rank of Brigadier General; 3 Assistant Quartermasters General, with the rank of Colonel; 4 Deputy Quartermasters General, with the rank of Lieutenant Colonel; 11 Majors; 50 Captains; 340 Captains of the Volunteer Army; and 12 Military Store-keepers.

To these must be added, during time of war, 6 inspectors appointed from the staff of the regular or volun-

teer armies, having temporarily the rank and pay of colonels.

The quartermasters of the regular army are usually graduates of West Point. The military store-keepers occupy a much more important position than that of our *gardes-magasins*; they have the care of enormous quantities of supplies. Store-houses of secondary importance are kept by employes, who are responsible only to the quartermaster by whom they are hired.

The quartermasters are usually specially distinguished officers and graduates of West Point; the present Quarmaster General, Brevet-Major General Meigs, was an engineer officer. During the entire war, he has directed the important service of the Quartermaster's Department.

A number of general officers of the volunteer army, who have rendered distinguished services during the war, are quartermasters in the regular army. Major General Hancock, one of the most brilliant of the Union generals, is a captain and quartermaster, as are also Generals Rufus Saxton and Robert Tyler, Colonel Dandy and Lieutenant Colonel Lothrop.

General Meigs, Quartermaster General, was appointed to the grade of Major General of Volunteers, and three colonels to that of Brigadier General of Volunteers, as a reward for distinguished services. General Rufus Ingalls, Quartermaster General of the army under the immediate command of General Grant, had the rank of Major General of Volunteers.

Assignment to Duty.—One chief quartermaster, with the temporary rank of colonel, is assigned to the headquarters of each department, army or army corps. One chief quartermaster, with the temporary rank of lieuten-

ant colonel, is assigned to the headquarters of each division.

In each regiment, the quartermaster is appointed by the colonel, with the approval of the Secretary of War. In each company there is a quartermaster-sergeant.

Chief quartermasters are appointed by the Secretary of War, upon the recommendation of the Quartermaster General, and remain on duty at the headquarters to which they are assigned, even though the commanding general be relieved.

Assignments to duty in the general supply service are made by the Quartermaster General, without regard to rank or grade; selections are made only of officers who are considered by him competent to perform the duties of that service. Thus the territorial department suppled from Louisville, extending as far as New Orleans, and including a district three times as large as France, is under the direction of a quartermaster, with the rank of major.

Supply Districts.—The division of the country into districts of supply, is made according to the necessities of the service, without regard to the limits of military departments.

Of the three colonels, one is stationed at Washington, as assistant to the Quartermaster General, one at Cincinnati and one at Philadelphia. Most of the wagons used in the service are manufactured at Philadelphia.

The lieutenant colonels are stationed at New York, Pittsburg and San Francisco.

The officers of the Quartermaster's Department are under the absolute control of the Quartermaster General, and are responsible only to him. He alone is responsible for the execution of the duties of his department. He is

authorized to make application to the Secretary of War for the detail of such line officers as may be needed for special service; for example, for cavalry officers in connection with the purchase of remounts. Officers thus detailed have the same status as though regularly belonging to the Quartermaster's Department.

Each chief quartermaster is independently responsible for the employes under his orders, and hires them without the intervention of the Quartermaster General. The latter, while forbidden to direct the hiring of any employe, may cause the discharge of any employe in his department, about whom he has damaging information; in such cases he does not himself order the discharge, but notifies the assistant by whom the employe is hired.

It is difficult to form an idea of the immense personnel of the Quartermaster's Department. When Washington was menaced by the Confederates, six thousand muskets were required to arm the quartermaster's employes in that city.

Contracts and Purchases.—In all branches of the service recourse is had to private industry. For the construction of railways, contracts are made with the most skilful civil engineers of the country; for vessels, with the leading shipbuilders; for wagons, with the best manufacturers. Shops are maintained by the department, however, in which repairs to wagons are made, and in which new wagons are built when emergency requires it. It has been found more advantageous in ordinary cases to purchase wagons than to manufacture them.

Purchases are made usually after public advertisement, but emergency purchases in open market have been frequent, owing to the urgent necessities of the war.

Organization of the Bureau at Washington.—The central bureau of the Quartermaster's Department is situated at Washington. It consists of nine divisions, the chiefs of which have the rank of colonel. The following summary indicates the functions of the various divisions:

First Division. Purchase and distribution of horses and mules for the service of the department, of the cavalry and artillery; of wagons, ambulances, etc.

Second Division. Clothing, camp and garrison equipage.

Third Division. Chartering and hiring of vessels for the transportation of the army, of prisoners of war, and of supplies, when used upon the ocean, bays and the northern lakes; of steamers belonging to or hired by the War Department, except steamers and other craft used on the western rivers.

Fourth Division. Purchase, hire and maintenance, for the transportation of the army and its supplies, of wagons and of boats used on the western rivers; railroads, telegraph lines for military purposes; steamboats and gunboats, hired by or belonging to the War Department, for use on the western rivers.

Fifth Division. Forage and straw.

Sixth Division. Construction and repair of barracks and quarters, hospitals, store-houses, stables, bridges, (other than railroad bridges); renting of quarters for officers and troops, of sites for cantonments and lands needed for other military purposes.

Seventh Division. Purchase and issue of ambulances, field forges, harness not furnished by the Ordnance Department; fuel; construction and repair of roads, not including railroads; payment of mileage and commutation

of rations, of expenses of courts-martial, of allowances to officers on escort duty; subsistence of prisoners of war and refugees; office expenses of the department.

Eighth Division. Inspection of the service. The inspecting officers, upon discovering any error or neglect, cause it to be speedily rectified by order of the Quartermaster General. All these orders are sent to the chief of the division controlling that branch of the service.

Ninth Division. Correspondence, reports and accounts of the various branches of the service.

GENERAL REGULATIONS OF THE DEPARTMENT.

Chiefs of the divisions advertise in the newspapers the articles or services required by their branches of the service. In making purchases, regard is had not only to the quality of the stores furnished, but also to the moral character of the person furnishing them.

Receipt of Stores.—All stores are received by inspectors, upon whose receipts and certificates, in the form prescribed by the Quartermaster General, payment is made under the direction of the chiefs of division.

Depots.—Depots are established near each army. An inspection is made prior to the shipment of stores, and orders are issued to prevent too great demands on any depot.

Emergency Purchases.—In case of emergency, when supplies required by a general are not on hand at a depot, direct purchases can be made upon his order, without advertisement. The quartermaster who makes the purchase will note the fact on his abstract of expenditures, together with the reason for the emergency.

Monthly Reports.—Reports are rendered every month to the Quartermaster General by the chief quartermaster

of each military department, showing the operations of each depot, estimates of funds required and a statement of contracts entered into. These reports are transmitted to the chiefs of division. Failure to make such report is considered as an indication of fraud and the pay of the quartermaster is withheld until he has furnished satisfactory proof of innocence to the Secretary of War.

Penalty for Corrupt Conduct.—Any inspector who is guilty of corrupt conduct is punished as a court-martial may direct, and by publication of his name in general orders and in the newspapers of his place of residence. Any contractor who is guilty of bribery or attempt to bribe, has his contract annulled.

Quartermasters and their agents are liable to the same penalties. If the Quartermaster General deems it advisable, purchases made in such cases may be retained.

Naval Officers and Constructors as Assistants.—The inspector is assisted by a naval officer when receiving a vessel, or by a constructor of known ability when receiving craft used on the western rivers.

We will make special report of the supply of forage, of remounts, of stationery, of quarters, of clothing and of transportation.

FORAGE.

Forage is obtained by public contract, but the contractor delivers the forage to the quartermaster, who issues it to the troops.

Ration.—The forage ration is fourteen pounds of hay and twelve pounds of oats, corn or barley. One hundred pounds of straw per month is allowed for bedding. For mules the ration is fourteen pounds of hay and nine pounds of grain. For mules belonging to officers, the ra-

tion is the same as that for a horse. Forage is issued only in kind. The selling of forage is prohibited. An officer can not sell forage issued to him, and receives forage only for horses actually kept by him. Forage issued to public horses or cattle is public property, and what is not consumed must be properly accounted for.

Whenever the state of the supplies makes it necessary to reduce the ration, commanding officers prescribe what part shall be issued.

Number of Rations to Which Officers are Entitled.—In time of peace, general and field officers are entitled to forage for three horses; officers below the rank of field officers, in the regiment of dragoons, cavalry and mounted riflemen, two horses; all other officers entitled to forage, one horse. In time of war, allowance is made to a Major General for seven horses; Brigadier General, five horses; Colonels of mounted troops, five horses; other Colonels, four horses; Lieutenant Colonels and Majors of mounted troops, four horses; Lieutenant Colonels and Majors of infantry, three horses; Captains of mounted troops, three horses; all other officers entitled to forage, two horses.

REMOUNTS.

All horses used by the army are purchased by the Quartermaster's Department. This perfectly logical system, which permits the selection from amongst a large purchase of horses of those suited for draft or cavalry purposes, which enables the destination of horses to be changed when necessary and which allows large numbers of horses to be kept unassigned, was attacked by the officers of cavalry in the early part of the war. As a result of these attacks, a remount service for cavalry was established. The cavalry bureau was under the command of a

Major General of cavalry, assisted by ten officers of that arm, with the title of inspector.

The Cavalry Bureau.—The bureau organized at first two great depots, one in Pennsylvania, the other at Saint Louis. Each of these depots had a capacity of twelve thousand horses. Afterwards about twenty lesser depots, with a capacity of three or four thousand horses each, were established. Dismounted regiments were sent to these depots, were completely reorganized and then returned to the army.

Purchases of horses were always made by contract. The Quartermaster General advertised in the newspapers for proposals for the delivery, at a specified time and place, of a certain number of horses and mules of suitable size, age and sex. The contractors then searched the country, and offered to the quartermaster detailed to receive them, such horses as they had obtained. Owners of horses also had the right to offer horses for purchase, but such direct purchases were unusual. The designated quartermaster determined the price of each animal without exceeding a maximum fixed by the Quartermaster General.

The cavalry bureau wished to make direct purchases and thus save for the government the profits of the middlemen. Horses immediately advanced in price. Then the unreasonable requirements of the cavalry officers and their ignorance of business methods, so discouraged the trade in horses that it was found necessary to return to the first system. On April 14, 1864, the bureau was reorganized by orders from headquarters of the army, and became the first division of the Quartermaster's Department. A lieutenant colonel and quartermaster is charged with the purchase and inspection of the horses; the direc-

tion of the depots, of equipment and of regimental inspections is reserved to the cavalry officers.

American Horses.—While the American cavalry horses resemble those of our dragoons, the draft horses in no way resemble our Percheron and Flemish horses. They are generally very large horses, shaped like the horses of our carbineers, and are often even of greater size. It is said, however, that at the beginning of the war there were in service draft horses from Vermont, which were remarkably fine looking and strongly built.

A short sketch will be given of the different breeds of horses in America. There are few horses of unmixed blood; almost all are the result of the crossing of Flemish, French, Spanish and English breeds.

In New York, the first horses imported by the Dutch East India Company, in 1625, were Flemish horses. Crossing with English horses and the fashion of racing, have modified considerably the primitive breed. The New York horse is noticeable to-day because of the strength of his muscles and his good blood.

In Massachusetts, Vermont and the Eastern States, the influence of the horses brought, in 1629, from Leicesshire, and afterwards crossed with the English dray-horse, is recognizable in the average product. The two breeds are, however, found with their distinctive characteristics.

In Pennsylvania, a breed of horses is found, called Conestoga horses. This breed of draft horse is of Flemish origin, modified by crossing with the English brewer's horse, which is itself probably descended from the Flemish horse.

In Maryland, Virginia and South Carolina, the pure English blood predominates; the work horses are therefore imperfect and badly formed animals.

In Louisiana and most of the Western States, Spanish and French blood predominates, modified slightly by crossing with English breeds.

In Texas, the wild horses have preserved all the characteristics of Spanish horses.

In Canada, the importation of Norman, Breton and Percheron horses was begun in 1604. The elimate, food and perhaps crossing with Indian ponies of Spanish origin, have changed these breeds completely, and have resulted in an excellent breed of broad-backed, tireless horses, few of which are, however, imported into the United States. It is to be feared that this breed will receive a new modification through the influence of English breeds.

It is in the West, and principally in Illinois, that horses suitable for cavalry service are found. The French possessed in this region, since 1750, a large number of horses; since the cession of the Mississippi Valley to the United States, horses of different types, but especially half-bred draft horses, have been introduced in great numbers and have given rise to underbred horses of easily recognizable characteristics. All are noted for their spirit and strength. Accustomed to long marches, living for weeks, and often entire months, on grass alone, without straw, hay or grain of any kind, always exposed to the weather, to the most bitter cold as well as the most intense heat, to severe rains and even to torrid winds, it will be readily seen that they are remarkably well adapted to the military service. But the needs of the present war soon compelled the remount service to extend its operations beyond this region.

The resources of the United States in saddle, draft and pack horses, are enormous. In 1860, the number of horses was 6,115,458; more than double the number in

both France and Algeria. The number of asses and mules was 1,129,553.

Cost of Horses.—The prices of horses are generally less than those which obtain in Europe. At the beginning of the war, large sized horses were worth one hundred and twenty dollars; in July, 1865, the price had risen to one hundred and seventy dollars. Mules were worth, in 1861, from one hundred to one hundred and twenty dollars; in 1864, from one hundred and seventy to one hundred and eighty dollars. These prices, which would be considered very reasonable in Europe, seemed excessive in America; moreover, it must be noted that payment was made in paper money, which was very much depreciated in value. Fancy horses, the great trotters, are, however, valued at very high prices.

Consumption of Horses.—The consumption of horses and mules during the war has been enormous; it is no exaggeration to say that it has exceeded 300,000 animals.

When horses are purchased they are sent to the depots, but are usually placed in the service immediately. The depots are used especially for receiving and recuperating exhausted horses. Those which are found to be so worn out as to be unfit for further service, are sold and branded in such way as to prevent their being repurchased.

The operations of the cavalry bureau during the last six months of the year, 1864, will be seen from the following summary:

Horses on hand, unassigned, July 1, 1864, -	17,517
Purchased, July 1, 1864, to December 31, 1864,	98,555
Received from various sources, - -	60,050
Received from the artillery, - - -	1,545
Total, - - - -	177,667

Sent to regiments,	121,521
Sold,	8,598
Lost, died or killed,	13,672
Sent to the artillery,	4,014
On hand, unassigned, December 31, 1864,	29,862
Total,	117,667

The number of horses purchased for the artillery, between September 1, 1864, and June 30, 1865, was 20,714. During this period 2,904 artillery horses were received from various sources. Of these horses, 15,683 were sent to the artillery, 4,806 were sold, died or were transferred to the cavalry. There were on hand, at the end of June, 1865, 3,475 artillery horses, unassigned. It must be remembered that Richmond was captured April 10, 1865, and that the army was mustered out at the end of June. Between these two dates the operations of the remount service were necessarily very limited.

The number of mules purchased during the same period, is shown by the following summary:

On hand, unassigned, September 1, 1864,	15,885
Purchased,	45,921
Received from various sources,	57,089
Total,	118,895
Issued for service,	61,911
Sold,	13,479
Lost, died or killed,	7,336
On hand, unassigned, June 30, 1865,	36,169
Total,	118,895

The resources of the country in mules were more nearly exhausted than the supply or horses. The maximum price of horses rose during the war from one hund-

red and thirty to one hundred and seventy dollars; that of mules rose from one hundred and twenty to one hundred and ninety-five dollars.

STATIONERY.

Stationery and Printing.—This service is quite important, amounting as it does to more than two hundred thousand dollars per annum. It includes all the printed books and records necessary for the accounts of the various corps, and the stationery allowances of officers, which are issued only in kind. These allowances are made quarterly. The commander of an army, department or division receives all that may be necessary for himself and staff for their public duty. Issues are made quarterly to other officers as follows:

	Quires of writing paper.	Quires of envelope paper.	Number of quills.	Ounces of wafers.	Ounces of sealing wax.	Papers of ink powder.	Pieces of office tape.
Commander of a brigade, for himself and staff	12	1	50	1	8	2	2
Officer commanding a regiment or post of not less than five companies, for himself and staff	10	1	40	1	6	2	2
Officer commanding a post of more than two and less than five companies	8	½	30	½	5	1	1
Commanding officer of a post of two companies	6	½	25	½	4	1	1
Commanding officer of a post of one company or less, and commanding officer of a company	5	½	20	½	3	1	1
A lieutenant colonel or major not in command of a regiment or post	3	½	12	½	2	1	1
All officers, including chaplains, when on duty and not supplied by their respective departments	1½	⅛	6	⅛	1	½	½

Officers of the Inspector General's, Pay and Quartermaster's Departments, in addition to the prescribed blank

books and printed forms, are allowed the stationery required for their public duty.

To each office table is allowed one inkstand, one stamp, one paper folder, one sand box, one wafer box, and as many lead pencils as may be required, not exceeding four per year. Steel pens, with one holder to twelve pens, may be issued in place of quills, and envelopes in place of envelope paper, at the rate of one hundred to the quire.

The printed forms are of two kinds, loose sheets and bound record books. It is difficult to estimate the value of the former, including as they do all the accounts and reports of the Ordnance, Pay, Subsistence and Quartermaster's Departments. These blanks are printed on fine paper and are distributed in great numbers. The registers and record books are no less remarkable for the excellence of the paper and binding. The cost of the books of a regiment was, in 1864, as follows: order book, $0.48; letter book, $0.48; index book, $0.28; regimental fund book, $0.78; total, $2.02. The cost of the books of a company was: order book, $0.19; morning report book, $0.25; clothing book, $0.41; descriptive book, $0.22; total, $1.07. At this time paper money was at its lowest value; in 1863, the total cost of the books of a regiment was only $1.55.

BARRACKS AND QUARTERS.

Under this head are included the permanent buildings for the use of the army, as barracks, quarters, hospitals, store-houses, offices and stables.

A description of the hospitals has already been given in this report; the barracks, quarters and stables will now be described.

American Buildings.—In America all the houses are made of wood, except in some of the large cities, where brick, sandstone and marble are sometimes used. Generally, structures intended for use as barracks or quarters have been made of wood. We have not seen monumental barracks like those of Europe; the military quarters resemble those at the camp of Chalons. It must also be remembered that before the war the effective strength of the army was only 7,000 men, and that these buildings, which are now called permanent, are nevertheless like those of a temporary camp.

The wood shows on the outside of the building; horizontal boards, placed like the slates on a roof, make a rain proof wall. The inner face of the wall is plastered with a mortar made of lime and sand.

Description of the Quarters of a Regiment.—The space occupied is 210 yards long and 180 yards wide. The buildings are distributed around this space, near the center of which are the quarters of the officers. All of these buildings have galleries on the ground floor in front, and small porches, which protect the entrances, which are at the ends of the building.

In front are two barracks for the troops, 128 feet by 24 feet, separated by a small guard house, 36 feet by 18 feet. To the right are two more barracks; to the left are a barrack and a hospital. In rear is the building used by the staff officers. Behind these buildings and forming a second line are, on the left, the wagon park; on the right, the picket lines for the horses. Further back, forming a third line, are, on the left, the quartermaster and commissary store-houses; on the right, the stables; in the center, two latrines.

Administrative Building.—The building used by the staff officers is 66 feet by 33 feet. Itis divided by two corridors in the form of a cross. The entrance is covered by a porch; the stairway is in the rear half of the entrance corridor. It consists, on the ground floor and second floor, of eight rooms of equal size, 15 feet by 13.5 feet. One of the rooms, used as a dining room, connects by means of a small covered passage with a one-story kitchen, 14 feet by 12 feet, built on the outside.

Barracks.—The five barracks are built on the same plan; they are 128 feet by 24 feet, and are divided into two exactly symmetrical parts. At each end is a porch covering the entrance; a portico runs the whole length of the front of the building.

On the ground floor, on the right and left symmetrically, are a large kitchen, 20 feet by 15 feet, a small store-room, a dining room, four officers' rooms, a wash room and a stairway. The stairway opens upon the portico; its lower landing communicates both with the dining room and the wash room. This wash room is a complete toilet room, and, in view of the cleanly habits of the Americans, is one of the most important rooms in the building.

The second story is used as a dormitory; its arrangement is quite peculiar and might well be tried in France. The beds are arranged in three tiers with two men in each bed; so that six men sleep in a space only 5.25 feet long. In this way a room, 62.3 feet by 20 feet, can be used as a dormitory for ninety-six men.

This system, which at first sight seems to violate all hygienic rules, is found to work well in America. This may be attributed to the extreme cleanliness of the men, to the custom of never eating in the dormitory, and to the

use of the gallery in the daytime, so that few of the men rest on their bunks, and finally, to the excellent system of ventilation which we will now describe.

Ventilation.—In summer, the cold air enters through openings made underneath the floor and, when it has become impure, escapes through an opening at the ridge. In winter, the cold air passes between the cast-iron stove and a zinc casing, which covers about three-fourths of the stove. In this way it is heated. When impure, it is driven out through a wooden shaft, which is nothing more than a box containing the stove pipe and reaching to its opening above the roof. The exit used in the summer is carefully closed in winter.

It may be doubted that even with all these conditions a similar system of space-saving barracks would be healthy. One thing at least is certain, the American barracks are perfectly healthy. During the greatest heat of summer, we visited the veteran reserve barracks at the Philadelphia hospital and yet found none of the nauseating odors which can not be gotten rid of in our best kept barracks.

Hospital.—It has not, however, been thought that a similar system is suitable for use in a hospital. In a regimental hospital, which is a one story building, the beds are separated and not arranged in tiers. The building is 91.5 feet by 24 feet. To the left of the entrance are two small rooms 10 feet square. The principal room is 24 feet by 74.5 feet; it contains thirty-two beds and two stoves and ventilators. There is also a bath room with water closets; opposite this is a dispensary. A kitchen, 18 feet by 16 feet, is connected with the hospital by means of a covered passage.

The commissary and quartermaster store-houses are in no way remarkable.

Stables.—Many plans have been used in the construction of the stables. A plan has at last been definitely adopted which appears to be most satisfactory, both as to cheapness of construction and healthfulness. The horses are placed in stalls; the harness is hung on pegs projecting from the stall posts. The width of the stable is 28 feet.

Latrines.—As to the latrines, these are the most remarkable features of the American military structures. No barrack, however small, is without its latrines, as clean and odorless as those of the best kept house in France. A continual stream of water is used without any special apparatus. The excellent condition of the latrines is due to unceasing care and to the remarkably cleanly habits, which it can not be too often repeated, are found to exist even among the lowest classes of society.

The methods employed in camp merit special mention, and might well be adopted or at least tried in the camp at Chalons.

A trench, 10 feet long, 3 feet wide and 6 feet deep, is dug; the earth being carefully thrown to the rear. A wooden bar, firmly supported on pickets at 27 inches from the ground, is placed along the front of the trench and prevents the fouling of the ground in front of the trench. A fatigue party throws part of the earth kept in rear into the pit three times each day. When the trench is two-thirds full, the rest of the earth is thrown in and a new trench is dug at a greater distance. By this system the Army of the Potomac, although sometimes restricted to small spaces during the heat of the summer, was free from the horrible odors which are found in rear of every line of quarters in the camp at Chalons.

The troops are not always quartered in specially constructed buildings. Use is often made of hired buildings,

which are modified so as to be adapted to use as quarters for troops.

Commutation of Quarters.—Houses are also sometimes specially built for the quartering of officers, but in most cases officers are paid commutation in lieu of quarters. The amount varies in different localities and is based upon the following allowance of quarters:

Number of rooms and amount of fuel for offices and men:

	ROOMS.			CORDS OF WOOD PER MONTH.	
	As quarters.	As kitchen.	As office.	From May 1 to Sept. 30.	From Oct. 1 to April 30.
Major General	5	1	..	1	5
Brigadier General or Colonel	4	1	..	1	4
Lieutenant Colonel or Major	3	1	..	1	3½
Captain or Chaplain	2	1	..	¾	3
Lieutenant	2	1	..	½	2
Military store-keeper	1	1	..	..	..
The General commanding the army	..	..	3	..	3
Commanding officer of a geographical division or department, an Assistant or Deputy Quartermaster General	..	..	2	..	2
Commanding officer of a regiment or post, Quartermaster, Assistant Quartermaster or Commissary of Subsistence	..	..	1	..	1
The Senior Ordnance officer stationed at the headquarters of a military department	..	..	1	..	1
The Assistant Adjutant General at the headquarters of the army, the Assistant Adjutant General, the Medical Director and Medical Purveyor of a military department	..	..	1	..	1
Officers of the pay department	..	..	1	..	1
Wagon and forage master, Sergeant Major, Ordnance Sergeant, Quartermaster Sergeant, Medical Cadet or Principal Musician	1	..	..	½	1
Each non-commissioned officer, musician, private, officer's servant and washerwoman	..	..	..	1/12	⅙
Each necessary fire for the sick in hospital, not exceeding	..	..	..	½	2

A cord consists of 128 cubic feet; it may be exchanged for 1,500 pounds of anthracite coal or 30 bushels of soft coal. Two cords of pine wood may be issued in lieu of one cord of oak wood, provided that such issue may be made without increased expense.

Commutation of quarters is paid monthly, at the rate of nine dollars per room, at Boston, New York, Philadelphia, Baltimore, Washington, Charleston, Key. West, Mobile and New Orleans, and at all posts in Texas and the Territories of New Mexico, Oregon and Washington. At the rate of eight dollars per room, at Detroit, Chicago and St. Louis and at all places east of the Rocky Mountains, not heretofore enumerated. At San Francisco, twenty dollars per room is paid, and at all other places in California, twelve dollars.

Officers are deprived of their cummutation if absent for a period exceeding six months. Commutation for quarters is never paid in the field.

Annual Inspection of Buildings.—An annual inspection of buildings at the several stations, is made at the end of June by the commanding officer and quartermaster. The latter then makes a report: 1st, of the condition of the buildings and of the additions and repairs made during the past year; 2nd, of the additions, alterations and repairs that are needed, with plans and estimates in detail. This report is examined by the commanding officer and forwarded by him to the Quartermaster General, with his views. When private buildings, occupied as barracks or quarters, or lands occupied for encampments, are vacated, a similar inspection is made.

Necessary repairs of public buildings, not provided for in the appropriations, are made as far as practicable by the labor of troops.

CLOTHING AND EQUIPAGE.

Coats are made by the Quartermaster's Department at New York, Philadelphia, Cincinnati and Saint Louis; trousers at Quincy. The establishments at these places furnish, however, only a small part of the clothing used by the army; they furnish a standard of price and quality for the rest of the clothing, which is purchased by contract. Equipage and boots and shoes are obtained only by contract.

At the beginning of the war the boots and shoes furnished were very defective; they are now of much better quality. There are no regular shoemakers or tailors in the regiments, and the repairs are made voluntarily by soldiers, who are paid for such work by their comrades.

Allowance of Clothing.—An annual allowance of forty-five dollars is made to each volunteer soldier, with which to purchase his clothing. His account is balanced at the end of each year, and if it is found to be overdrawn, a deduction of the amount is made from his pay. Ordinarily the company commander issues clothing to his men twice a year, but he may make issues whenever he finds it necessary. Quartermaster's furnish necessary clothing to company commanders upon their requisitions. A requisition states the names of the men for whom the clothing is intended, together with the state of their clothing accounts. If the money value of the clothing furnished a soldier during the year has exceeded his money allowance, the excess clothing is considered as an extra issue, and its money value is charged against him on the pay rolls sent to Washington.

It will be seen that there are no regular issues of clothing and that it is greatly to the interest of the soldier to take good care of his equipment, which is replaced

only when in bad condition. This system has had but little effect, however, in checking the wasteful nature of the American soldier.

A soldier is allowed the clothing stated in the following table:

	YEAR OF SERVICE.				
	First.	Second.	Third.	Fourth.	Fifth.
Hat	1	1	1	1	1
Coat or jacket	2	1	2	1	2
Greatcoat	1	..	..	..	..
Trousers	3	2	3	2	3
Flannel Shirt	3	3	3	3	3
Flannel drawers	3	2	2	2	2
Stockings, pairs	4	4	4	4	4
Bootees, pairs	4	4	4	4	4
Leather gaiters	1	..	1	..	..
Stable frock (for mounted men)	1	..	1	..	..
Fatigue overalls (for engineers and ordnance)	1	1	1	1	1
Blanket, woolen	1	..	1	..	..

Mounted men may receive one pair of boots and two pairs of bootees, instead of four pairs of bootees.

Prices of Clothing.—It will be interesting to note the prices of some of the articles of clothing. In 1863, the prices were as follows: hat, $1.65; coat, $7.00; jacket, $5.30; trousers, $2.70; flannel shirt, $1.53; flannel drawers, $0.90; stockings, $0.32; boots, sewed, $3.35; boots, pegged, $2.92; bootees, sewed, $2.05; bootees, pegged, $1.48; greatcoat, $7.50; woolen blanket, $3.25; rubber poncho, $1.70; leather gaiters, $1.20; canvas gaiters, $0.68; knapsack, $1.85; haversack, oil-cloth, $0.33; haversack, rubber, $0.49.

In 1864, the prices were the same, except as follows: trousers, $3.75; greatcoat, $8.50; woolen blanket, $3.60;

poncho, $2.10; leather gaiters, $1.65; canvas gaiters, $0.90; knapsack, $2.15; oil-cloth haversack, $0.40; rubber haversack, $0.67.

Assuming as a basis the cost of clothing in 1863, the money equivalent of the regular allowances of clothing during the five years of service, are as follows:

	YEAR OF SERVICE.					TOTAL.	TOTAL IN 1864.
	1	2	3	4	5		
Sergeant of artillery..	$55 48	$31 12	$45 00	$31 12	$40 37	$203 09	$282 23
Sergeant of infantry..	53 03	30 72	43 96	30 72	40 62	199 05	271 55
Private of artillery...	54 48	30 52	44 00	30 52	39 37	198 89	277 67
Private of infantry...	52 03	30 12	42 96	30 12	39 62	194 85	269 54

In view of this great increase of the cost of clothing it has been proposed to increase the money allowance.

Purchases of Clothing by Officers.—Officers of the army may purchase, at the regulation price, from the Quartermaster's Department, such clothing as they may need—certifying that the articles are intended for their own personal use.

Damaged Clothing.—Inventories of damaged clothing in store are made and reductions are made in its price according to its condition. Commanding officers may order necessary issues of such damaged clothing to prisoners, convicts or captured deserters.

Camp and Garrison Equipage.—Under this heading are included tents, tools, cooking utensils, flags, standards, guidons and musical instruments.

The tents furnished for officers have a double roof and are very comfortable both in hot and cold weather.

One shelter tent is ordinarily furnished for the use of three soldiers. They are, however, sometimes provided with large square tents, similar to those used by officers.

ALLOWANCE OF EQUIPAGE FOR OFFICERS AND SOLDIERS.

	Tents in the field.	Spades.	Axes.	Pick axes.	Hatchets.	Camp kettles.	Mess pans.
General	3	..	1	..	1	..	..
Field Officer	2	..	1	..	1	..	..
Captain	1	..	1	..	1	..	..
Lieutenant, to every two	1	..	1	..	1	.	..
To every 15 foot or 13 mounted men	1	2	2	2	2	2	5

TRANSPORTATION.

General Considerations.—The following is an extract from the President's message of 1863.*

"The rebel armies live mainly upon the country through which they pass, taking food and forage alike from friends and foes.

"This enables them to move with ease and great rapidity. Our commanders operating in the rebel States, generally find no supplies, and in the border States it is difficult to distinguish between real friends and enemies. To live upon the country passed over, often produces great distress among the inhabitants. But it is one of the unavoidable results of war, and is justified by the usages of civilized nations. Some of our commanders have availed themselves of this right of military appropriation,

* Report of General Halleck, dated Nov. 15, 1863, accompanying the Report of the Secretary of War.

while others have required too large a supply of trains, and have not depended as much as they might have done upon the resources of the country in which they operated.

"General Grant says, in his official report: In the march from Brunesburgh to Vicksburgh, covering a period of twenty days, before supplies could be obtained from the Government stores, only five days' rations were issued, and three of these were carried in the haversacks at the start and were soon exhausted.

"Instructions have been given to the generals operating in hostile territory, to subsist their armies as far as possible upon the country, receipting and accounting for everything taken, so that all persons of approved loyalty may hereafter be remunerated for their losses.

"Some of our officers hesitate to carry out these measures, from praiseworthy but mistaken notions of humanity; for what is spared by us is almost invariably taken by the rebel forces, who manifest very little regard for the sufferings of their own people. In numerous cases women and children have been fed by us to save them from actual starvation, while fathers, husbands and brothers are fighting in the ranks of the rebel armies, or robbing and murdering in the ranks of guerrilla bands.

"Having once adopted the system of carrying nearly ten days' supplies with the army in the field, a system suited to countries where the mass of the population takes no active part in the war, it is found very difficult to effect a radical change. Nevertheless our trains have been very considerably reduced within the past year. A little greater reduction, however, will be required to enable our troops to move as lightly and rapidly as those of the enemy.

Sutlers.—"In this connection, I would respectfully call your attention to the present system of army sutlers.

There is no article legitimately supplied by sutlers to officers and soldiers, which could not be furnished at a much less price by the Quartermaster and Commissary Departments. Sutlers and their employes are now only partially subject to military authority and discipline, and it is not difficult for those who are so disposed to act the part of spies, informers, smugglers and contraband traders.

"The entire abolition of the system would rid the army of the incumbrance of sutlers' wagons on the march, and the nuisance of sutlers' stalls and booths in camp. It would relieve officers and soldiers of much of their personal expenses, and would improve the discipline and efficiency of the troops in many ways, and particularly by removing from the camps the profligate evils of drunkenness."

It would be difficult to better present the question of transportation in the American army. In a hostile country, an army must use or destroy all the resources of the country, not only because of the advantage to itself, but also to prevent the enemy from making use of them. It will nearly always be found that the enemy has carried off all the supplies. It will then be usually found necessary to carry all the supplies in the trains; but every wagon not strictly necessary to the service should be forbidden.

Wagons.—Large canvas covered wagons are used, which are drawn by a team of six horses or mules, managed by a single driver, who is mounted on the near wheeler. By means of a strap held in the left hand he can apply a kind of brake, which is so powerful that, without need of dismounting, he can descend the steepest grades. The minimum load of this wagon is 1,100 pounds.

Ambulances.—There is also another kind of wagon called an ambulance. It is a spring wagon, drawn by two

or four horses and driven by one man. It resembles those described under the head of the Medical Department. One ambulance is allowed to each Major General or Brigadier General.

Pack Animals.—Pack animals are used only in exceptional cases.

Officer's Baggage.—The amount of an officer's baggage, which is transported free, is very small. The allowances in the field are:

For a general officer,	125 pounds
For a field officer,	100 "
For a captain or lieutenant,	80 "

In cases of change of station, this allowance is considerably increased; but in such cases use is not made of the kind of transportation above described. The allowances in such cases are:

For a general officer,	1,000 pounds
For a field officer,	800 "
For a captain,	700 "
For a lieutenant,	600 "

Supplies Carried.—The army train is principally used in carrying supplies of food, forage, clothing and ammunition. It must not be forgotten that the amount of forage required by the trains themselves sometimes exceeds that which is to be delivered to the combatant forces.

Supplies at Nashville for General Grant's Campaign.—When General Grant, using Nashville as a base, was advancing on Chattanooga, the supplies stored in Nashville for the use of his army, had a money value of fifty million dollars. They included forage for 50,000 animals for three months, and supplies of all kinds for 100,000 men for eight months.

Supplies at Chattanooga for General Sherman's Campaign.—When General Sherman began his advance upon Atlanta, using Chattanooga as his base, there were provided at that place thirty days' rations for 100,000 men and clothing for six months.

Train of General Sherman's Army.—The trains following these armies were enormous. When General Sherman made the turning movement, which made him master of the city of Atlanta, he reduced his trains to the lowest possible numbers. Although the total number of the forces engaged in that movement did not exceed 35,000 men, it was found that the trains could not be made smaller than 3,000 wagons.

During the march from Atlanta to Savannah, nothing was known of Sherman's position, yet, so thorough were the preparations of the Quartermaster Department that, on the day after the capture of Savannah, a vessel entered the harbor laden with new clothing for his entire army.

The western armies have always used much larger trains than has the Army of the Potomac, which, operating in Virginia, was able to obtain some supplies from the country and was never very distant from its base on one of the navigable rivers in direct communication with Washington.

Conduct of the Train During the Virginia Campaign.—The quartermaster trains following the armies are conducted with great skill. At the opening of the Virginia campaign, in 1864, the Federal Army of the Potomac was encamped behind the Rapidan River. It was composed of three army corps, a cavalry corps, the artillery reserve and an engineer brigade, and was commanded by General Meade. The Ninth Corps, under General Burnside, operated in conjunction with that army,

making about 125,000 effective men. The whole force was commanded by General Grant, who was General-in-Chief of all the armies of the United States.

Lee's army was occupying a position on the opposite bank of the river, ready to defend the passage of the river or to intercept a march upon Richmond, the capital of Virginia, the approaches to which city it was covering.

Everybody knows the result of the terrible campaign, in which the Federal losses, at the battles of the Wilderness, Spottsylvania and Cold Harbor, amounted to 60,000 men.

Lee was unable to prevent the crossing of the Rapidan, but a three days' battle ensued in the dense forest, known as the Wilderness. The two armies marched parallel to each other, and Lee took up a position at Spottsylvania which Grant unsuccessfully attacked.

Grant, continuing to march upon Richmond, manœuvred his army between the North Anna and the South Anna; the crossing of these two rivers being marked by bloody and indecisive battles. Finally, after the unfortunate assault at Cold Harbor, where Lee had taken position, Grant undertook his famous change of base and, deceiving the Confederate general as to his intentions, moved his entire army across the James River, thus throwing his forces to the south of Richmond. His adversary was meanwhile seeking him in the Peninsula, and had remained in position at Malvern Hill, expecting further attack.

The crossing of the Rapidan occurred on the 4th of May. On the 12th of June, two army corps crossed the James on an immense pontoon bridge, which had been constructed by the Engineers and Quartermaster Department. The other two corps had been embarked upon the Chickahominy, a tributary to the James, and the whole

army was reunited at City Point, on the right bank of the James.

The train of this army consisted of 4,300 wagons; 835 ambulances; 29,945 artillery, cavalry, ambulance and team horses; 4,046 private horses, and 22,528 mules.

The troops were issued fifty rounds of ammunition and three days' full rations; meat rations for three days were driven on the hoof. A small train accompanied the troops, containing grain and rations for ten days; a small number of spring wagons and pack animals also immediately accompanied the army.

All the rest of the train was placed under the orders of the Chief Quartermaster of the army, who followed all the movements of the army, establishing and abandoning magazines; transporting the wounded to the rear in wagons, which returned empty; building bridges, sometimes using an excellent portable suspension bridge equipage; sometimes cutting down forests and always opposing the attacks of the enemy's cavalry, which continued to harass the train. Finally, at 2 o'clock in the afternoon, of the 25th of June, it commenced the passage of the James, and did not complete the crossing until 7 o'clock in the morning of the 27th.

So skilful had been the dispositions made during all these marches, that for the first time since the beginning of the campaign, the troops saw the train of 4,000 heavy wagons when it arrived at City Point. Only the small-arm ammunition trains had been seen and the park accompanying the rear guard had not lost even a single forge.

All the labor of the construction of bridges, wharves and roads had been performed under the orders of quartermasters. Great magazines were established and broken up with wonderful rapidity. At Belle Plaine, the first

depot on the Potomac, the wharf had to be built well out into the stream in order to obtain sufficient depth of water for the vessels. This wharf, and the two bridges which connected it with the bank, were built in twenty-four hours. In six days there were disembarked 25,000 men, the rations, ammunition and material for the army for fifteen days, the forage for 60,000 animals for the same period; 25,000 wounded and 7,500 prisoners had also been embarked. The wharf was then, under the same conditions, transported to Port Royal, on the Rappahannock.

The pontoon bridge over the James River, a stream 700 yards wide and 89 feet deep, upon which the army crossed in twenty-four hours, had been built by the quartermasters. It was fastened by means of hawsers to sailing vessels, four of which were placed down stream and three up stream. It was found to be remarkably rigid.

Telegraph Lines.—During these two months of the campaign, 345 miles of telegraph line had been built, not including the temporary lines joining the headquarters of the corps commanders. There had been built 31 miles of railroad over an entirely new line; an equal length of destroyed railroad had been repaired, and the rails of 19 miles of railroad had been carried off.

Similar great works of the Quartermaster Department occurred in every theatre of war, from the Potomac to the Gulf of Mexico. In the beginning of 1864, General Banks made an advance in Texas; the Federal fleet ascended the Red River, carrying the supplies of the army. Banks' army was driven back and, at the same time, the fleet was cut off by a sudden fall of the river. The peril was imminent, as the Confederates could, if they acted with a little vigor, sieze the vessels and the expedition would have ended in frightful disaster. The

army constructed, in eight days, an immense dam, which raised the level of the water and enabled the fleet to return to the Mississippi.

SUPPLY OF HORSES AND WAGONS DURING THE YEARS 1862-63.

The supplies of horse, wagons and other stores were necessarily enormous. A summary has been given of the purchases of horses and mules during the year of 1862-63; to this must be added 60,000 cattle, 12,730 heavy wagons, 3,511 ambulances, 77 light wagons, 111,978 pairs of wheels and sets of harness. There were in service, in November, 1863: 197,557 horses, 110,068 mules, 2,010 cattle, 17,796 heavy six-mule wagons, 4,160 ambulances, 276 light spring wagons, and 154,357 pairs of wheels and sets of harness.

Losses.—During the year 1862-63, there were lost, destroyed or rendered unserviceable: 57,576 horses, 17,170 mules, 1,486 cattle, 816 heavy wagons, 232 ambulances, 41 spring wagons, and 11,825 pairs of wheels and sets of harness.

Expenses.—The expenses of the Quartermaster Department during the same year, were as follows:

1. SUPPLIES—

Fuel,	$1,217,802.39
Forage,	9,033,015.90
Straw,	87,373.24
Office expenses,	208,764.59
Total,	$10,546,956.12

2.	INCIDENTAL EXPENSES—	
	Postage,	$78,576.80
	Expenses of courts-martial,	33,906.12
	Escorts and dispatches,	31,692.95
	Interments,	87,272.75
	Guides, interpreters and spies,	90,597.05
	Clerks and agents,	574,595.63
	Wagon and forage masters,	7,605.18
	Laborers,	810,683.55
	Extra duty pay of soldier laborers,	560,756.60
	Veterinary surgeons,	16,631.58
	Stationery,	40,218.29
	Veterinary supplies,	39,292.39
	Forges and farriers tools,	90,919.10
	Horse and mule shoes,	286,191.38
	Picket ropes,	5,804.70
	Apprehension of deserters,	28,617.47
	Total,	$2,783,361.54
3.	Horses for cavalry and artillery,	$3,958,530.32
4.	Transportation of supplies for prisoners,	95,836.47
5.	Military telegraph lines,	253,198.33
6.	BARRACKS AND QUARTERS—	
	Purchase of sites,	576,965.82
	Construction and repair,	1,782,799.84
	Total,	$2,359,765.66
7.	Transportation of officers and their baggage,	$203,428.32
8.	TRANSPORTATION—	
	Clothing,	204,589.35
	Rations,	948,287.32
	Ordnance and ordnance stores,	597,567.53
	Troops and material,	38,861,011.15
	Total,	$40,814,883.67

9.	Purchase of stoves and ranges, -	$90,522.78
10.	Clothing and equipage, -	55,887,505.58
11.	Organization of volunteers, -	77,692.80
12.	Construction and repair of gunboats,	606,811.73
13.	Construction of steam rams, -	314,448.74
13.	EXPENSES AUTHORIZED FOR OTHER DEPARTMENTS—	
	Medical Service, - - -	303,448.60
	Ordnance Corps, - -	96,148.69
	Pay Department, - -	881.25
	Commissary Department, -	10,411.66
	Engineers, - - -	2,278.13
	Adjutant General's Department,	16,277.76
	Stables at Carlisle, - -	161.59
	Printing, - - -	96,097.95
	Total, - - -	$525,705.63
	Grand Total, - -	$118,469,249.87

Accountability.—The accounts of money and property are of two kinds:

1. Reports and monthly statements which refer almost entirely to property; consisting of inventories, abstracts of issues and receipts, reports of employes with their pay, etc.

2. Quarterly reports, which are aggregates of the monthly reports, supported by vouchers and receipts which serve as a basis for determination of money accountability.

Monthly returns must be transmitted to the Quartermaster General within five days after the month to which they relate; quarterly returns within twenty days after the quarter.

Special reports are made of useful information in regard to the routes and means of transportation of supplies.

MILITARY RAILWAY SERVICE.

Importance of the Service.—It is the opinion of all the American soldiers that none of the great campaigns of the War of Secession, could have been undertaken but for the use that could be made of the railways and large navigable rivers. Marches, like that of Sherman from Nashville to the Atlantic Coast, that of Burnside from Louisville to Knoxville, or that of Grant, in his last campaign, between Washington and Petersburg, would certainly have ruined any army that undertook them before the advent of railways.

Owing to the great number of railway companies, with widely different resources, to the consequent difficulty of perfecting arrangements for transportation, and to the necessity for special knowledge in matters relating to the construction and operation of railways, it was found necessary, early in the second year of the war, to organize a military railway department.

Up to that time the quartermasters had made contracts for transportation with the various companies. After the introduction of the new system possession was taken, under contracts readily approved by the War Department, of all roads and rolling stock needed for military operations. These roads were then placed under the control of a special administrative service, which had no connection with the Quartermaster Department except in money accountability.

The service was created by the order issued by the Secretary of War, February 11, 1862, which indicates clearly the importance and power of the new service. It reads as follows:

"*Ordered*, That D. C. McCallum be, and he is hereby, appointed military director and superintendent of rail-

roads in the United States, with authority to enter upon, take possession of, hold and use all railroads, engines, cars, locomotives, equipments, appendages and appurtenances, that may be required for the transport of troops, arms, ammunition and military supplies of the United States, and to do and perform all acts and things that may be necessary and proper to be done for the safe and speedy transport aforesaid."

By order of the President, commander-in-chief of the army and navy of the United States.

EDWIN M. STANTON,
Secretary of War.

Additional Orders.—In order to insure the execution of the foregoing order, the following additional order was issued, to which must be attributed most of the success of the new system:

"Commanding officers of troops along the United States military railroads, will give all facilities to the officers of the roads and the quartermasters, for unloading cars so as to prevent any delay. On arrival at depots, whether in the day or night, the cars will be instantly unloaded, and working parties will always be in readiness for that duty, and sufficient to unload the whole train at once.

"Commanding officers will be charged with guarding the track, sidings, wood, water-tanks, &c , within their several commands, and will be held responsible for the result.

"Any military officer who shall neglect his duty in this respect, will be reported by the quartermasters and officers of the railroad, and his name will be stricken from the rolls of the army.

"Depots will be established at suitable points, under the direction of the commanding general, and properly guarded.

"No officer, whatever may be his rank, will interfere with the running of the cars, as directed by the superintendent of the road.

"Any one who so interferes will be dismissed from the service for disobedience of orders."

Division into Systems.—The military railways were divided into groups or systems: that of the Potomac, comprising 611 miles; of the Mississippi, 1,201 miles; of the Atlantic Coast, 293 miles.

Organization of a System.—There were two distinct departments: the "transportation department" and the "construction corps."

The chief of the transportation department was called the "general superintendent of transportation and maintenance of roads in use." He was charged with conducting transportation, managing the movement of trains, keeping the roadway, bridges, buildings and other structures in repair, building new structures and rebuilding old ones when and where necessary. He was required always to keep on hand a sufficient supply of rolling stock, and keep in order the locomotives and cars and manage the shops where such work is done.

For conducting transportation, each principal line was operated by a superintendent of transportation, who was held responsible for the movement of all trains and engines over it. Subordinate to the superintendent, were one or more masters of transportation, according to distance operated, who were constantly moving over the road to see that the employes attended properly to their duties while out with their trains.

At stations, where locomotives were changed or kept in reserve, an engine despatcher was stationed to see that the locomotives were in good order for service, that they were promptly repaired or replaced if necessary.

Maintenance of road and structures for each line was in charge of a superintendent of repairs, with the necessary supervisors, road-masters, foremen, &c.

Maintenance of rolling stock was in charge of the master machinist, who managed repairs of locomotives, and the master of car repairs, under whose charge all repairs to cars were made.

All these officers reported directly to the general superintendent, who appointed and discharged them and fixed their rates of pay and allowances, making report to the director general.

This service was required to be always ready to respond to the requisitions of the commanders of armies; such requisitions were often in the form of mere verbal requests. In this way the Fourth Army Corps was, in 1865, transported from Carter Station to Nashville, a distance of 373 miles; the movement required 1,498 cars. The number of employes sometimes was as great as 12,000 in the Mississippi system alone.

Construction Corps.—The construction corps was under the general charge of the chief engineer, whose duties consisted of the reconstruction of destroyed lines and the opening of new lines when necessary. He had full control of the entire construction corps, an organization which is distinctly American and which owes its existence to the necessities of the war.

The corps was composed of divisions, varying in number according to the needs of the service; in the Mississippi system it sometimes consisted of 5,000 men, or-

ganized in six divisions. Each division was made a complete whole in itself, equipped with tools, camp equipage and field transportation, and was under the command of a division engineer. It was divided into subdivisions or sections, each of which was under the immediate command of a supervisor. A subdivision was composed of gangs, each under a foreman.

A division completely organized, was composed as follows:

1 division engineer, 1 assistant engineer, 1 rodman, 1 clerk, 2 messengers, 5 subdivisions and a train crew.

The first subdivision consisted of 1 supervisor of bridges and carpenter work, 1 clerk and time-keeper, 1 commissary, 1 quartermaster, 1 surgeon, 1 hospital steward, 6 foremen (one for each 50 men), 30 sub-foremen (one for each 10 men), 300 mechanics and laborers, 1 blacksmith, 1 blacksmith's helper and 12 cooks; total strength, 356.

The second subdivision consisted of 1 supervisor of track and the same number of assistants, mechanics, laborers, cooks, &c., as for the first subdivision; its total strength being also 356.

The third subdivision consisted of 1 supervisor of water stations, 1 foreman, 12 mechanics and laborers, and 1 cook; total, 15.

The fourth subdivision consisted of 1 supervisor of masonry, 1 foreman, 10 masons and helpers, and 1 cook; total, 13.

The fifth subdivision consisted of 1 foreman of ox brigade, 18 ox drivers, and 1 cook; total, 20.

The train crew consisted of 2 conductors, 4 brakemen, 2 locomotive engineers, 2 firemen, and 1 cook; total, 11.

The total strength of the division was, therefore, 777 men.

Duties of Employes.—The commissaries had charge of drawing, caring for and issuing rations. The quartermaster had charge of tools, camp equipage, field transportation, &c. Each foreman was responsible for the tools and other government property issued to his gang.

Each supervisor reported the time made by the men in his subdivision, through his division engineer, to the chief time-keeper, who was stationed at the headquarters of the chief engineer.

The surgeons were appointed by the chief engineer, and were paid out of a private fund voluntarily contributed by the men for hospital purposes.

Sub-foremen were appointed by the foremen, subject to the approval of the division engineer. Foremen were appointed by the division engineer, subject to the approval of the chief engineer. Division and assistant engineers were appointed by the chief engineer, subject to the approval of the general manager of the military railway service.

Work of the Divisions.—Such is the organization to which the American army certainly owes the greater part of its success; by its aid it was made possible to accomplish the gigantic operations of which we have already made some mention.

The Orange and Alexandria Railway had been completely destroyed between Manassas Junction and Brandy Station, a distance of twenty-two miles; in seven days, eleven miles of the road had been completely rebuilt.

The bridge over the Rappahannock, 625 feet long and 35 feet high, was rebuilt in nineteen working hours. In the same campaign, the bridge over the Potomac, 424

feet long and 82 feet high, was built with equal speed; after forty hours' work the trains were able to cross it and carry the wounded from the field of Spottsylvania.

Sherman's campaign includes the greatest works of the railway service. Few soldiers in the field were exposed to as great danger and hardship as were the men of the railway service. They went often for five, or even ten days, without any sleep except what they could snatch during the loading and unloading of trains; they had no regular meals, and were obliged to be always ready to defend themselves against the numeraus guerillas who tried to destroy the railroad in rear of the trains.

Sherman's line of communications was no less than 360 miles long. The railway followed the army step by step; it was necessary to reconstruct the line which the rebels always destroyed when they retreated. All the supplies of the army of 100,000 men and 60,000 horses, mules and beef-cattle, had to be transported over a single-track railway. When Johnston retreated from Buzzard's Roost toward Atlanta, he destroyed the railway as completely as possible, in order to prevent Sherman from pursuing. Relying on the energy of the construction corps, Sherman did not delay an instant, and the results showed that his confidence was not misplaced.

On the 4th of October, 1864, Hood moved around Sherman's army and destroyed the railroad, first at Big Shanty and afterwards to the north of Resaca; tearing up thirty-five miles of railway, destroying 455 lineal feet of bridges, and killing or capturing a large force of men of the railway service. The detachments of the construction corps, which had succeeded in escaping, were quickly rallied, and before Hood had completed the work of destruction, two construction divisions took position at the ends

of the ten mile gap at Big Shanty, re-established communication and were ready to move to Resaca as soon as the enemy abandoned that place. Before retiring, Hood destroyed all the supplies of railway material, so that it was necessary to cut the ties and to place them further apart than usual; most of them had to be carried by hand, as the teams could not arrive until after the work was done. The rails needed to relay the southern part of the breach had to be brought from the railways south of Atlanta, and those for the northern part were brought from Nashville, a distance of more than 200 miles. Notwithstanding all these difficulties, this gap of thirty-five miles was completely repaired and trains were running over it in seven and a half days from the time the work was commenced.

Rolling Mill at Chattanooga.—The military railway department was obliged to provide a system for the supply and repair of rails.

There were on hand 302 miles of old, bent and twisted rails, weighing 11,864 tons, which had been gathered along the railroads of the Mississippi system, after their destruction by the Confederates; 21,000 tons of new rails had been bought at $145 per ton. The old rails could be re-rolled at a cost of $50 per ton, which would result in a saving to the government of more than a million dollars. The general manager of military railways, therefore, proposed to purchase an abandoned Confederate rolling mill at Chattanooga, to move it within the Union fortifications, and to complete and repair it so as to be able to use it for re-rolling all the unserviceable rails on hand.

The purchase,* construction, machinery and all the work of adapting the mill to the service required of it, cost $290,329.51.

Unfortunately the mill did not go into operation until April 1, 1865, and was in operation only five months and a half. The average cost of the 3,818 tons of rails manufactured, was only $35 instead of $50, as had been expected. Only 466 tons of these rails were used in repairing tracks; the rest being sold in October to southern railroads, at public auction, for $175,000.†

Resume.—The greatest number of men employed in the railway service, at the same date during the war, was 24,964. The total number of miles of railway operated, was 2,105. The number of engines used, 419. The number of cars, 6,330. The number of lineal feet of bridges, built or rebuilt, 101,2[illegible] The length of track, laid or relaid, 642 miles.

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*"It was found that many important parts of the machinery, provided by the rebels for the rolling mill, were not at hand; they were, in fact, still within their lines, and no probability existed of obtaining them uninjured within any reasonable time, if at all. Therefore it was decided to build entirely new machinery throughout, and of the most improved pattern used in the rolling mills of the north. The mill-building, partially completed by the rebels, was declared by the military authorities too far from the fortifications at Chattanooga to be safe, and after careful investigation of the question, the building was abandoned and a new one erected in a secure location. To reach the site selected, and properly accommodate the mill, required building one and two-thirds miles of railroad. Thus, instead of completing a partially built work, an entirely new and very superior rolling mill, in point of machinery, was the result. The total cost of the mill complete and ready for work, was $290,329.51."—Report of General McCallum.

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† The quantity sold realized in cash the sum of $269,128.58.

The amount expended during the war was:

For labor, - - -		$23,105,562.89
For materials, - - -		19,356,579.66
Total, - - -		$42,462,142.55
From which must be deducted:		
Receipts from sales of property, -	$10,894,944.29	
Receipts from passengers and freight, -	1,525,493.04	
Receipts from hire of rolling stock, -	103,528.50	
Property on hand, (estimated) -	100,000.00	$12,623,965.83
Net expenditure, -		$29,838,176.72

This sum was furnished from the appropriation made for the expenditures of the Quartermaster's Department.

All the military railroads and their material were returned to the companies to which they originally belonged by Executive Order of August 8, 1865. They were therefore in the hands of the government for three years and a half.

THE SUBSISTENCE DEPARTMENT.

Personnel.—The Subsistence Department furnishes rations to troops in garrison or in the field. Its personnel consists of 1 Commissary General of Subsistence, with the rank of brigadier general; 1 Assistant Commissary General, with the rank of colonel; 2 Assistant Commissarys-General, with the rank of lieutenant colonel; 8 Commissaries, with the rank of major; and 8 Commissaries with the rank of captain.

These officers form a part of the regular army. There are also 370 volunteer commissary officers, with the rank of captain.

Subsistence Supplies.—Subsistence supplies comprise:

1. Articles composing the ration, called subsistence stores.

2. The necessary means of issuing and preserving these stores, called commissary property.

The storehouses and means of transportation necessary for the service of Subsistence Department are furnished by the Quartermaster's Department.

Purchases and Contracts.—Purchases of subsistence stores are made under written public contracts or in open market. The usual method is that under contract.

The Commissary General, with the approval of the Secretary of War, designates the places where contracts

shall be made. The less important stores are usually purchased in this way at Boston, New York, Philadelphia, Cincinnati, Louisville and Saint Louis. The same is true of flour.

Upon the receipt of stores, they are examined by an inspector who certifies as to their quality. The commissary officer at the place of delivery makes the payment to the contractor. If not provided with funds for payment, he receipts for the articles accepted on duplicate inspection certificates, one of which he gives to the contractor; the other is forwarded to the Commissary General, who directs the payment of the account.

Since the beginning of the war, purchases in open market have become much more frequent than formerly. The higher officers of the Subsistence Department are allowed great latitude which, in a country of such great publicity, they can scarcely abuse. No contractor, for any kind of stores, ever makes deliveries directly to the troops; stores are always received by an officer of the Subsistence Department.

Depots.—Permanent and temporary depots are established throughout the country, each of which is managed by an agent of the Subsistence Department.

Food Supplies.—There is no bakery system although there are, at Cincinnati and Virginia, two great establishments in which biscuit and bread are baked by the Subsistence Department. Portable ovens are used to bake fresh bread for the armies, but the greater part of the bread supply is furnished from New York, where proposals are received from bakers for the baking of biscuit or for furnishing biscuit or hard bread.

Beef cattle are procured under contract or purchased in open market. Beef received on the hoof is accounted

for on the returns by the number of cattle and by their net weight in pounds. When beef cattle are transferred, their loss or gain in weight is reported. From the live weight of a steer, his net weight is determined by deducting forty-five per cent., when his gross weight exceeds 1,300 pounds, and fifty per cent., when less than that and not under 800 pounds,

The shipment and driving of beef cattle constitute an important part of the service. The meats issued to the troops at New Orleans came from New York and had therefore been transported nearly 3,600 miles.

Beef on the hoof accompanying an army is entirely under the control of the commissary officers. Herds of beef cattle are driven by special drivers who are directly under the orders of the chief commissary of the army, or of the army corps if a corps is acting alone. The position of the herd, its places of halting and the rate of its march are all controlled by the chief commissary, who receives orders in such matters only from the general to whose staff he pertains. When several army corps are united, the senior commissary officer is in charge of this branch of the service.

It would be difficult for a commissariat service to work more smoothly and certainly than does that of the American army, especially as that army is unable to live upon the country and must carry all its supplies.

The Ration.—The ration of the American soldier is incomparably better than that of the soldier in any European army.

It is composed as follows: twelve ounces of pork or bacon, or, one pound and four ounces of salt or fresh beef; one pound and six ounces of soft bread or flour, or, one pound of hard bread, or, one pound and four ounces of

corn meal; and to every one hundred rations, fifteen pounds of beans or peas and ten pounds of rice or hominy; ten pounds of green coffee, or, eight pounds of roasted coffee, or, one pound and eight ounces of tea; fifteen pounds of sugar; four quarts of vinegar; one pound and four ounces of candles; four pounds of soap; three pounds and twelve ounces of salt; four ounces of pepper; thirty pounds of potatoes, when practicable, and one quart of molasses.

Sergeants and corporals of the Ordnance Department, armorers, carriage-makers and blacksmiths, are entitled, each, to one and a half rations per day.

Rations to Negro Refugees.—Negro refugees and freedmen gathered within the lines or organized in villages, when out of employment and unable to obtain food (such as old people and the sick) are issued the following ration: ten ounces of pork or bacon, or, 1 pound of fresh beef; one pound of corn meal five times each week; one pound of flour or fresh bread, or, ten ounces of hard bread twice each week; and to every one hundred rations, ten pounds of beans, peas or hominy; eight pounds of sugar; two quarts of vinegar; eight ounces of candles; two pounds of soap; two pounds of salt; fifteen pounds of potatoes; and ten pounds of roasted coffee or fifteen ounces of tea.

The women and children under fourteen years of age are issued a half ration.

Rations are also issued to prisoners of war and to loyal families in invaded rebel states. In cases of excessive fatigue or severe exposure issues of whiskey are ordered by commanding generals.

Substitutions and Purchases of Savings.—The soldier's ration is in excess of his real needs; substitutions of other articles are therefore permitted, and savings are

purchased by the Subsistence Department. In this way there accrue in the companies, funds which are managed by the captains. These substitutions and sales of savings inure to the benefit of the soldier's condition.

Commutation of Rations.—Soldiers absent on furlough are also entitled to rations, which are commuted in money. The rates at which rations are repurchased or commuted, is calculated on the following basis:

100 rations of pork or bacon are 75 pounds, at 6 cts. per lb. 100 rations of fresh beef are 125 pounds, at 4 cts. per lb...	½ is	$ 4 75
100 rations of flour are 137½ pounds, at 4 cts. per lb.....		5 50
100 rations of beans or peas are 15 pounds, at 4 cts. per lb.		60
100 rations of rice are 10 pounds, at 5 cts. per lb..... 100 rations of hominy are 10 pounds, at 3 cts. per lb.....	½ is	40
100 rations of coffee are 10 pounds, at 15 cts. per lb..... 100 rations of tea are 1½ pounds, at 48 cts. per lb.....	½ is	1 11
100 rations of sugar are 15 pounds, at 8 cts. per lb.....		1 20
100 rations of vinegar are 4 quarts, at 4 cts. per quart.....		16
100 rations of candles are 1½ pounds, at 20 cts. per lb.....		25
100 rations of soap are 4 pounds, at 5 cts. per lb.....		20
100 rations of salt are 3¾ pounds, at 1 ct. per lb.....		04
100 rations of pepper are 4 ounces, at 1¾ cts. per ounce....		07
100 rations of potatoes are 30 pounds, at 2 cts. per lb.....		60
100 rations of molasses are 1 quart, at 12 cts per quart.....		12
Cost of 100 rations.....		$15 00

Or one ration 15 cents.

The proportions here given are fixed, but the prices of the component parts of the rations are variable; the actual cost of the ration during any month is determined by each store-keeper. The costs of transportation and storage are not included.

Sales to Officers.—Any officer may purchase subsistence from the commissariat, at cost prices, on his certificate that it is for the use of himself and family. Messes are also authorized to purchase supplies in the same manner. Summary statements of such sales, certified by the com-

manding officer, are sent monthly to the Commissary General.

Similar sales, in small quantities only, may be made when necessary to persons employed by the army, and to Indian agents for issue to Indians.

Recruiting Service.—It sometimes happens that recruiting parties are unable to obtain subsistence from the commissariat; in such cases it is obtained by the officers in charge on written contracts. The actual cost of subsisting his party is paid by the recruiting officer from subsistence funds. When the recruiting officer does not disburse subsistence funds, the contractor is paid by the Commissary General, on abstracts certified by the recruiting officer.

Wastage.—Commissary officers and agents are required to report each month, or oftener if necessary, the wastage on articles in store. Ordinary wastage must not exceed three per cent. on salt meats, flour, hard bread, sugar, vinegar, soap and salt; and one per cent. on beans, peas, rice, hominy, coffee, tea, candles and pepper. No wastage is allowed on fresh beef furnished directly from the butcher. Extraordinary wastage, errors in the estimated weight of beef on the hoof, and loss on cattle which have strayed or died, are made the subjects of special certificate, or other evidence, according to the magnitude of the case.

Damaged Stores.—When supplies on hand become damaged, the commissary accountable reports the fact to the commanding officer, who makes or causes to be made a critical inspection of them. Damaged stores are separated from sound stores and disposed of as ordered by the inspector.

Accountability.—Returns and accounts are made separately for funds and property.

The following returns, abstracts, &c., are rendered monthly to the Commissary General:

Return of provisions and forage for beef cattle received and issued in the month, with the invoices and receipts thereto belonging.

Abstract of issues to troops.

Abstract of issues to citizens.

Abstract of extra issues.

Abstract of issues to hospitals.

Abstract of provisions and forage purchased.

Abstract of sales to officers.

Return of all property, except provisions and forage, with the invoices and receipts thereto belonging.

Summary statement of funds received, expended, &c., in the month.

Every disbursing officer is required to submit to the auditor of the Treasury Department monthly, or immediately upon ceasing to be a disbursing officer, the following accouts, abstracts, &c.:

Account current.

Abstract of provisions and forage purchased and paid for in the month, with vouchers.

Abstract of all expenditures in the month, except for provisions and forage, with vouchers.

Abstract of sales to officers.

Receipts for funds transferred.

Expenses.—The expenses of the Subsistence Department during the war were:

From July 1, 1861, to June 30, 1862,	$ 48,799,521.14
From July 1, 1862, to June 30, 1863,	- 69,537,482.78
From July 1, 1863, to June 30, 1864,	- 98,666,918.50
From July 1, 1864, to June 30, 1865,	- 144,782,969.41
From July 1, 1865, to June 30, 1866,	- 7,518,872.54
Total, - - -	$369,305,764.37

In May, 1865, the process of mustering out the army began and continued until the end of the year 1866.

PAY DEPARTMENT.

Personnel.—The army is paid by the Pay Department, the officers of which are called paymasters. The department consists of 1 Paymaster General, with the rank of colonel; 3 Deputy Paymasters-General, with the rank of lieutenant colonel; and 25 Paymasters, with the rank of major.

These officers belong to the regular army. There are also 320 volunteer paymasters, of whom 33 have the rank of lieutenant colonel.

Pay Rolls.—Officers are paid monthly; non-commissioned officers and privates every two months.

Muster and pay rolls, transmitted to Washington from regiments, companies aud detachments, and certified by the mustering and inspecting officers, serve as the bases of payment. The paymasters are sent from Washington with the funds necessary for payment. A company is paid in the presence of its commander. Officers, non-commissioned officers and privates sign receipts for the amounts paid.

Stoppages of Pay.—Stoppages of pay are entered on the roll for fines by sentence of court-martial, extra issues of clothing, loss or damage to arms, debts to laundresses or sutlers, &c. Entry is also made on the roll of amounts due the soldier for commutation of rations, &c.

Deposits.—Non-commissioned officers and privates may deposit with the paymaster any portion of their pay, not less than five dollars at one time, for which amounts they are furnished certificates of deposit.

Such deposits are not liable to forfeiture by sentence of court-martial. In case of death of the soldier, the amount of his deposits, after paying his debts to the laundress or sutler, is paid to his heirs. The purchase or transfer of certificates of deposit is forbidden.

No officer or soldier is paid while in arrears to the government.

Stoppages for Ordnance Stores.—Every year, in the month of May, the Paymaster General transmits to the second auditor of the Treasury, a statement exhibiting the total amount during the year up to the 31st of December preceding, of stoppages against officers and soldiers on account of ordnance and ordnance stores. These stoppages are regulated by tables of cost published by the Chief of Ordnance, and have precedence of all other claims on the pay of officers or soldiers.

Returns and Reports.—The following returns and reports are transmitted to the Paymaster General, after each payment:

Estimate for succeeding months.

Abstract of payments, accompanied by the vouchers.

General account current.

Monthly statement of funds, disbursements, &c.

There is a separate accountability for payments in the regular and volunteer armies and in the militia, when in the service of the United Ststes. No militia or volunteers are paid until regularly mustered into service by the mustering officers.

TABLE OF PAY, SUBSISTENCE, ETC., ALLOWED BY LAW TO THE OFFICERS OF THE U. S. ARMY.

RANK AND CLASSIFICATION OF OFFICERS.	PAY.	SUBSISTENCE.		SERVANTS.		TOTAL MONTHLY PAY.	FORAGE.
	Per month.	Number of rations per day.	Monthly commutation value.	Number of servants allowed.	Monthly commutation value.		Number of horses.
GENERAL OFFICERS.							
Lieutenant General	$270 00	40	$360 00	4	$90 00	$720 00	$50 00
Aides-de-camp and Military Secretary to Lieutenant General, each,	80 00	5	45 00	2	45 00	170 00	2
Major General	220 00	15	135 00	4	90 00	445 00	5
Senior Aide-de camp to General-in-chief	80 00	4	36 00	2	47 00	163 00	2
Aide-de-camp, in addition to pay, &c., of Lieutenant or Captain	24 00	..	.....	..	.....	24 00	2
Brigadier General	124 00	12	108 00	3	67 50	299 50	4
Aide-de-camp, in addition to pay, &c., of lieutenant*	20 00	..	.....	..	11 00	.....	..
ADJUTANT GENERAL'S DEPARTMENT.							
Adjutant General—Brigadier General	124 00	24	216 00	3	67 50	407 50	4
Assistant Adjutant General—Colonel	110 00	6	54 00	2	47 00	211 00	2
Assistant Adjutant General—Lieutenant Colonel	95 00	5	45 00	2	47 00	187 00	2
Assistant Adjutant General—Major	80 00	4	36 00	2	47 00	163 00	2
Judge Advocate General—Colonel	110 00	6	54 00	2	47 00	211 00	2
Judge Advocate—Major	80 00	4	36 00	2	47 00	163 00	2

TABLE OF PAY, SUBSISTENCE, ETC., ALLOWED BY LAW TO OFFICERS OF THE U. S. ARMY.—Continued.

RANK AND CLASSIFICATION OF OFFICERS.	PAY.	SUBSISTENCE.		SERVANTS.		TOTAL MONTHLY PAY.	FORAGE.
	Per month.	Number of rations per day.	Monthly commutation value.	Number of servants allowed.	Monthly commutation value.		Number of horses.
Judge Advocate (Division)—Major	80 00	4	36 00	2	47 00	163 00	2
INSPECTOR GENERAL'S DEPARTMENT.							
Inspector General—Colonel	110 00	6	54 00	2	47 00	211 00	2
Assistant Inspector General—Major	80 00	4	36 00	2	47 00	163 00	2
SIGNAL DEPARTMENT.							
Chief Signal Officer—Colonel	110 00	6	54 00	2	47 00	211 00	2
Signal Officer—Lieutenant Colonel	95 00	5	45 00	2	47 00	187 00	2
Inspector—Major	80 00	4	36 00	2	47 00	163 00	2
Signal Officer—Captain	70 00	4	36 00	1	23 50	129 50	2
Signal Officer—Lieutenant	53 00	4	36 00	1	23 50	112 83	2
QUARTERMASTER'S DEPARTMENT.							
Quartermaster General—Brigadier General	124 00	24	216 00	3	67 50	407 50	4
Assistant Quartermaster General—Colonel	110 00	6	54 00	2	47 00	211 00	2

Deputy Quartermaster General—Lieutenant Colonel	95 00	5	45 00	2	47 00	187 00	2
Quartermaster—Major	80 00	4	36 00	2	47 00	163 00	2
Assistant Quartermaster—Captain	70 00	4	36 00	1	23 50	129 50	2
SUBSISTENCE DEPARTMENT.							
Commissary General—Brigadier General	124 00	12	108 00	3	67 50	299 00	4
Assistant Commissary General—Colonel	110 00	6	54 00	2	47 00	211 00	2
Assistant Commissary General—Lieutenant Colonel	95 00	5	45 00	2	47 00	187 00	2
Commissary of Subsistence—Major	80 00	4	36 00	2	47 00	163 00	2
Commissary of Subsistence—Captain	70 00	4	36 00	1	23 50	129 50	2
Assistant Commissary of Subsistence, in addition to pay, &c., of Lieutenant*	20 00	..	.....	..	.....	11 00	..
MEDICAL DEPARTMENT.							
Surgeon General—Brigadier General	124 00	12	108 00	3	67 50	299 50	4
Assistant Surgeon General—Colonel	110 00	6	54 00	2	47 00	211 00	2
Medical Inspector General—Colonel	110 00	6	54 00	2	47 00	211 00	2
Medical Inspector—Lieutenant Colonel	95 00	5	45 00	2	47 00	187 00	2
Surgeon of ten years' service	80 00	8	72 00	2	47 00	199 00	2
Surgeon of less than ten years' service	80 00	4	36 00	2	47 00	163 00	2
Assistant Surgeon of ten years' service	70 00	8	72 00	1	23 50	165 50	2
Assistant Surgeon of five years' service	70 00	4	36 00	1	23 50	129 50	2
Assistant Surgeon of less than five years' service	53 33	4	36 00	1	23 50	112 83	2
PAY DEPARTMENT.							
Paymaster General, $2,740 per annum	.....	..	.....	..	.....	288 33	..
Deputy Paymaster General	95 00	5	45 00	2	47 00	187 00	2
Paymaster	80 00	4	36 00	2	47 00	163 00	2
CORPS OF ENGINEERS AND ORDNANCE DEPARTMENT.							
Chief of Engineers or Ordnance	124 00	24	216 00	3	67 50	407 50	4

TABLE OF PAY, SUBSISTENCE, ETC., ALLOWED BY LAW TO OFFICERS OF THE U. S. ARMY.—Continued.

RANK AND CLASSIFICATION OF OFFICERS.	PAY.	SUBSISTENCE.		SERVANTS.		TOTAL MONTHLY PAY.	FORAGE.
	Per month.	Number of rations per day.	Monthly commutation value.	Number of servants allowed.	Monthly commutation value.		Number of horses.
Colonel	$110 00	6	$ 54 00	2	$47 00	$211 00	2
Lieutenant Colonel	95 00	5	45 00	2	47 00	187 00	2
Major	80 00	4	36 00	2	47 00	163 00	2
Captain	70 00	4	36 00	1	23 50	129 50	2
First, Second or Brevet-Second Lieutenant	53 33	4	36 00	1	23 50	112 83	2
CAVALRY AND LIGHT ARTILLERY.							
Colonel	110 00	6	54 00	2	47 00	211 00	2
Lieutenant Colonel	95 00	5	45 00	2	47 00	187 00	2
Major	80 00	4	36 00	2	47 00	163 00	2
Captain	70 00	4	36 00	1	23 50	129 50	2
Lieutenant or Brevet Lieutenant	53 33	4	36 00	1	23 50	112 83	2
Adjutant, Regimental Quartermaster or Regimental Commissary, in addition to pay of Lieutenant	10 00	..	.....	..	.....	10 00	..
HEAVY ARTILLERY OR INFANTRY.							
Colonel	95 00	6	54 00	2	45 00	194 00	2

Lieutenant Colonel	80 00	5	45 00	2	45 00	170 00	2
Major	70 00	4	36 00	2	45 00	151 00	2
Captain	60 00	4	36 00	1	22 50	118 50	..
First Lieutenant	50 00	4	36 00	1	22 50	108 50	..
Second Lieutenant or Brevet Lieutenant	45 00	4	36 00	1	22 50	103 50	..
Adjutant or Regimental Quartermaster, in addition to pay of Lieutenant	10 00	..	.....	..	.....	10 00	2
MILITARY STORE-KEEPERS.							
In the Quartermaster's Department, or at arsenals of the first class.	.....	..	.....	..	.....	124 16	..
At all other arsenals	.....	..	.....	..	.....	86 66	..
Chaplains	100 00	2	18 00	..	.....	118 00	1
MILITARY ACADEMY.							
Superintendent	110 00	6	54 00	2	47 00	211 00	..
Commandant of Cadets	95 00	5	45 00	2	47 00	187 00	..
Professor	.....	..	.....	..	.....	186 67	..
Assistant Professor of Drawing—Major	80 00	4	36 00	2	47 00	163 00	..
Professor of Assistant Instructor—Captain	70 00	4	36 00	1	23 50	129 50	..
Assistant Instructor—First Lieutenant	50 00	4	36 00	1	22 50	108 50	..
Assistant Instructor—Second Lieutenant	45 00	4	36 00	1	22 50	103 50	..
Surgron	80 00	8	72 00	2	47 00	199 00	..
Assistant Surgeon	53 33	4	36 00	1	23 50	112 83	..
Sword Master	125 00	..	.....	..	.....	125 00	..
Teacher of Music	60 00	..	.....	..	.....	60 00	..
Cadet	30 00	..	.....	..	.....	30 00	..

*A subaltern on duty in the General Staff, and paid additional for it, is not entitled to a fourth ration, hence the deduction of nine dollars.

MONTHLY PAY OF NON-COMMISSIONED OFFICERS, PRIVATES, ETC.

CAVALRY AND LIGHT ARTILLERY.

Sergeant Major, Quartermaster Sergeant, Saddler Sergeant, Commissary Sergeant or Chief Bugler or Trumpeter	$21 00	Veterinary Surgeon	$75 00
First Sergeant	20 00	Hospital Steward	30 00
Corporal	14 00	Farrier and Blacksmith	15 00
		Bugler or Trumpeter	13 00
		Private	13 00
		African Under Cook	10 00

ORDNANCE

Sergeant	$34 00	Saddler	$14 00
Corporal	20 00	Private, first class	17 00
Wagoner	14 00	Private, second class	13 00

ARTILLERY AND INFANTRY.

Sergeant Major, Quartermaster Sergeant, Commissary Sergeant and Principal Musician	$21 00	Artificer, artillery	$15 00
First Sergeant	20 00	Private	13 00
Sergeant	17 00	Musician	12 00
Corporal	13 00	Hospital Steward	30 00
		African Under Cook	10 00

SAPPERS, MINERS AND PONTONIERS.

Sergeant	$34 00	Private, second class	$13 00
Corporal	20 00	Musician	12 00
Private, first class	17 00	African Under Cook	10 00

IN HOSPITALS.

Medical Cadets	$30 00	Matron	$6 00
Hospital Stewards, first class	22 00	Female nurses, 40 cents per day and one ration.	
Hospital Stewards, second class	20 00		

Retained Pay.—Two dollars per month are retained from the pay of each soldier until the expiration of his term of enlistment.

Twelve and one-half cents per month are retained from the pay of all enlisted men, for the support of the Soldiers' Home.

All enlisted men are entitled to two dollars per month additional pay for re-enlisting, and one dollar per month for each subsequent period of five years' service.

The amounts set forth in the table show the net pay. The soldier is fed by the commissariat, and has an annual allowance of forty-five dollars for clothing. It will be seen, therefore, that the appropriation for pay alone is a heavy burden.

Expenses.—During the war, the Pay Department has disbursed or expended no less than $1,029,239,000.00.

The operating expenses of the department, losses, etc., have not exceeded three-fourths of one per cent. of the amount disbursed.

ACCOUNTS WITH THE TREASURY.

The four supply corps, viz:—Ordnance, Quartermaster's, Subsistence and Pay Departments—alone maintain accounts with the Treasury Department. These accounts are similar for all the departments.

If, for example, the Quartermaster General wishes that certain articles necessary for the service be purchased by the quartermaster at Philadelphia, he addresses a request, somewhat as follows, to the Secretary of War:

WAR DEPARTMENT, QUARTERMASTER GENERAL'S OFFICE,
Washington, D. C., April —, 186—.

No. 7—$1,000,000.00.

The Honorable, the Secretary of War:

SIR:—I have the honor to request that you will cause to be placed to the credit of Colonel X, Quartermaster,

stationed at Philadelphia, with the Subtreasurer of the United States at New York, the sum of one million dollars, subject to draft of said Colonel X, for disbursements under appropriations as follows:

Expenses for the Quartermaster's Department, - -	$140,000.00
Incidental Expenses of the Quartermaster's Department, - -	120,000.00
Purchase of Cavalry Horses, -	120,000.00
Barracks and Quarters, - -	120,000.00
Army Transportation, - -	120,000.00
Transportation of Officers, -	120,000.00
Clothing and Equipage, - -	120,000.00
Incidental Expenses of the Army,	140,000.00
Total, - - -	$1,000,000.00

Very respectfully,

Your obedient servant,

(*Signed.*) *The Quartermaster General.*

This request, approved by the Secretary of War is forwarded to the Secretary of the Treasury, who gives the necessary orders.

Abstracts of Expenditures.—A disbursing quartermaster renders abstracts and accounts of all disbursements made from funds placed to his credit; supporting each payment by a proper voucher.

The following is the form of such vouchers:

The United States.

To E. F., Dr.

DATE OF PURCHASE.	For	DOLLARS.	CENTS.
June 3, 1860.....	20 cords of wood, at — per cord...	$.....	.....
June 10, 1860.....	20,852 lbs of straw, at — per 100 lbs	.....	.....
		$.....	.....

I certify that the above account is correct and just; the articles are to be (or have been) accounted for on my property return for the——quarter ending on the——day of——186—.

A. B., *Quartermaster.*

Received at——, the——day of——, 186—, of C. D., Quartermaster U. S. Army,——dollars and——, in full of the above account. E. F.

The certificate is made by the officer who purchased and received the property. The receipt is taken by the officer who pays the account.

These abstracts and vouchers are transmitted, not to the Secretary of War, but to the Third Auditor of the Treasury Department, who is an examiner of accounts. They are sent by him to the Quartermaster General's office for examination, to determine if they conform to the regulations of the Quartermaster's Department. This examination is not decisive, and they are returned to the auditor, who verifies their accuracy and determines the legality of the expenditures.

After being passed by the Third Auditor, they are again scrutinized by a Second Auditor or by the Comptroller. This is their final auditing and, if found correct, the disbursing quartermaster is relieved from further accountability for the amounts.

Bonds of Disbursing Officers.—All officers of the Quartermaster's, Subsistence and Pay Departments, and all store-keepers, must give good and sufficient bonds, in such sums as the Secretary of War directs. Two sureties are required to each bond, who are bound jointly and severally for the whole amount of the bond. Each surety

must satisfy the Secretary of War that he is worth more than the amount of the bond; the government is thus always fully protected.

These bonds are renewed once in four years, or oftener if the Secretary of War so directs. They are also renewed whenever the disbursing officer enters upon the duties of a new position.

ADMINISTRATION AND ORGANIZATION.

Administration of the Regiment.—From what has been stated, it will be readily seen how simple is the administration of a regiment. The commanding officer of a body of troops, whether colonel or captain, is not hampered with supply duties or money accountability, and is therefore enabled to devote himself entirely to his purely military duties. To this fact is due the facility with which large armies, aggregating more than a million men, have been improvised.

The payment of the troops is attended to by the paymasters, whose basis of payment is the muster roll forwarded to Washington.

Arms and ammunition are entrusted to ordnance sergeants, who are selected and appointed by the Secretary of War, in much the same way as are our *chefs armuriers*. An ordnance sergeant performs the duties of an armorer and store-keeper.

The Quartermaster's Department is represented in each regiment by the regimental quartermaster, and in each company by a quartermaster sergeant.

The senior lieutenant of the regiment performs the duties of a commissary officer, and receives additional pay at the rate of eleven dollars per month.

Requisitions are made upon the Ordnance, Quartermaster's and Subsistence Departments, on very simple

printed forms, covering all possible cases, which are not difficult even for an inexperienced officer.

Company Books.—The books of a company are reduced to four: an order book, a morning report book, a clothing book and a descriptive book.

The order book contains copies of regimental orders. The morning report shows the number of officers and soldiers present for duty or otherwise, and the number absent on furlough or duty. One copy of each daily report is retained by the company; the retained copies are bound together. The clothing book shows the issues made to the men. The descriptive book is little more than a copy of the morning report book.*

Regimental Books.—The books of a regiment are reduced to three; a letter book, containing the date of each letter sent or received, with a brief summary of its contents, and the name and address of the person to whom sent or from whom received; an order book, containing copies of general and regimental orders; and a descriptive book, which is a collation of the company descriptive books, with a general index. When this descriptive book is filled, it is forwarded to the Adjutant General.

All reports and returns relating to the strength of the regiment or to matters pertaining to the Adjutant General's Department, are entrusted to the adjutant, whose duties are like those of the major of a French regiment, except that he is relieved from any administrative duty.

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*One page of the descriptive book will be appropriated to the list of officers; two to the non-commissioned officers; two to the register of men transferred; four to the register of men discharged; two to register of deaths; four to register of deserters—the rest to the company descriptive list.—Army Regulations, 1863, par. 127.

Council of Administration.—There are, however, in each regiment and post, councils of administration, whose duties relate mainly to matters of police, such as fixing the laundress' charges, the tariff of prices of sutler's goods, the maximum credit to be allowed by sutlers to enlisted men, etc. The regulations prescribe that a sutler shall not sell on credit to an enlisted man to a sum exceeding one-third of his pay, within the same month; but the council may fix a lower limit, say one-fourth or one-fifth, if necessary.

The council consists usually of three members, and determines all matters relating to the funds accruing in posts, regiments and companies. A post fund is raised at each post by a tax on the sutler not exceeding ten cents a month for every officer and soldier of the command, and from the saving on the flour ration, ordinarily 33 per cent, by baking the bread at a post bakery.

ORGANIZATION OF AN ARMY.

Composition of a Brigade.—A brigade properly consists of two regiments, but this rule is by no means generally followed. Owing to the reduction in the strength of regiments, a greater number have been formed into a brigade; in the Army of the Potomac there were some brigades which consisted of ten or twelve regiments.

The Division and Army Corps.—A division usually consists of two, three or even four brigades. An army corps consists of a like number of divisions. The strength of an army corps is generally nineteen or twenty thousand men. This strength serves as a basis for the organization of the brigades, rather than any prescribed number of regiments. Supposing two brigades to a division and three divisions to an army corps, in order to obtain an effective strength of 20,000 men, the brigades

would have to be about 3,300 men strong. We have seen that the average strength of regiments became reduced to scarcely 500 men; in such cases, seven regiments would be needed to form one brigade.

An Army.—An army corps sometimes operates independently; the Ninth Corps, for example, in the campaign of 1864, commanded by General Burnside, was considered as a separate army. It was united, in the latter part of June, with the Army of the Potomac, commanded by General Meade, which then consisted of five corps. General Butler also commanded a separate army consisting of two corps; all these armies were commanded by General Grant.

Thus it will be seen that an army can not be considered as the highest organization of troops in campaign, since several armies may operate together under a single commander. Another case of this kind was that of Sherman's army which, upon leaving Chattanooga, consisted of three distinct armies, each with its own commanding general.

THE STAFF.

There are on the staff of each brigade, division, army corps and army, officers representing the various branches of the military service which have been described.

The personal staff of the general commanding a brigade includes an officer, with the rank of major, who performs the duties of quartermaster and commissary, an ordnance officer, and a surgeon, with the rank of major.

On the staff of a division there are, in addition, an engineer officer, an artillery officer and a signal officer.

The staff of an army corps consists of a similar body of officers, except that the chief quartermaster has the rank of lieutenant colonel and does not perform the duties of commissary, which are assigned to a separate officer.

Staff of the Army of the Potomac.—The staff of the Army of the Potomac was composed as follows:

1. A chief of staff, with the rank of brigadier general, who was occupied with purely military matters.

2. An adjutant general, with the rank of brigadier general, charged with all the administrative duties, returns and correspondence, which are attended to by the chief of staff of a French army. This division among two officers of duties, which in France are performed by a single officer, has given the best of results.

3. An aide-de-camp and several orderly officers.

4. A judge advocate general, charged with matters pertaining to the administration of military justice.

5. A chief quartermaster, with the rank of colonel.

6. A chief commissary of subsistence, with the rank of lieutenant colonel.

7. A chief of engineers, with the rank of lieutenant colonel.

8. A chief of artillery, with the rank of brigadier general.

9. A signal officer, with the rank of major.

10. An inspector general, with the rank of colonel.

11. A medical director, a medical inspector and two surgeons.

TERRITORIAL COMMANDS.

In addition to the organic division of troops in campaign, there is a further separation of commands into districts with centralized authority, known as military departments.

Military Departments.—The number and limits of these departments have varied with the changing condi-

tions of the war. At the beginning of the war the division was approximately as follows:

I. The Department of the East, subdivided into three departments:

1. Department of Washington, comprising the District of Columbia and all adjacent forts, and that part of the State of Maryland included between Bladensburg and Baltimore. The headquarters was at Washington.

2. Department of the South, headquarters at Fortress Monroe, including Eastern Virginia, North Carolina and Tennessee.

3. Department of Annapolis, headquarters at Annapolis, including all the country situated within twenty miles on either side of the railroad from Annapolis to Washington.

II. Department of Pennsylvania, headquarters at Philadelphia, including Pennsylvania, Delaware and all of Maryland, except that indicated above.

III. Department of the West, headquarters at Saint Louis, including all the country between the Mississippi and the Rocky Mountains, as far south as the borders of New Mexico.

IV. Department of Texas, including the district in rebellion.

V. Department of New Mexico, headquarters at Santa Fé, including the Territory of New Mexico.

VI. Department of the Pacific, headquarters at San Francisco, including all the country west of the Rocky Mountains.

VII. Department of Utah, headquarters at Camp Floyd, including all the Territory of Utah, except that portion west of the 117th meridian of longitude.

The capture of New Orleans permitted the reorganization of the Department of Texas, which was called the Department of the Gulf, and included Louisiana, Texas, Mississippi, Alabama and Florida. Its headquarters were at New Orleans.

The Department of Pennsylvania was extended to include the State of New York, and its headquarters were moved to New York.

After a number of changes, the number of departments has been fixed, since the end of the war, at thirteen:

Department	of the East,	with headquarters at	Philadelphia
"	of the Lakes,	with "	" Detroit
"	of Washington,	with "	" Washington
"	of the Potomac,	with "	" Richmond
"	of the South,	with "	" Charleston
"	of the Tennessee,	with "	" Louisville
"	of the Gulf,	with "	" New Orleans
"	of the Arkansas,	with "	" Little Rock
"	of the Missouri,	with "	" Fort Leavenworth
"	of the Plains,	with "	" Omaha
"	of Dakota,	with "	" Fort Snelling
"	of California,	with "	" San Francisco
"	of the Columbia,	with "	" Portland

Commanders of Military Departments.—Each military department is commanded by a major general, on whose staff is an officer of each branch of service, who is charged with the supervision of matters within that department pertaining to his proper branch.

The generals are under command of the President, commander-in-chief of the army and navy, of the lieutenant general, of the chief of staff, and of the Secretary of War. Matters of supply and administration relate only to the bureaus of the War Department.

The action of the lieutenant general is felt in military operations which he thinks it necessary to direct. The chief

of staff exercises control only in matters pertaining to reports of such operations.

The *intendance* and *l'état-major*, two bodies of such great importance in the French army, do not exist in America. Their functions are performed by separate and distinct services: the Adjutant General's, Quartermaster's, Subsistence, Pay, Medical; and one might add, the Ordnance Departments.

The military commander, instead of dealing with only one official, is required to keep up relations with each of the departments which provides for the wants of the army. This method is certainly much less convenient for a general than our system; and it may be inferred that by it the general is forced to occupy his mind with details, which in the end always reduces his independence of action, because upon them depends, in great measure, the success of his military operations.

The concentration of so many duties, as exhibited in the French *intendance*, may sometimes require more than human ability, and reduce the independence of the chiefs of service who feel themselves protected by a higher official, whose supervision, distracted by so many different objects, is often illusory. And often the mere signatures which will be necessary for this supervision, may require a long and precious day's work, and waste the time of the supervisor in mere manual labor.

FLAGS AND STANDARDS.

In an army in which the uniform of all regiments is the same, the nature of the guidons, standards and special flags becomes a matter of great importance; especially if the army operates in a broken and wooded country. Such is the case in America.

The system of special flags adopted by the Army of the Potomac was very ingenious. A single glance at a headquarter flag floating over a tent or a house, revealed at

once the arm of service, brigade, division and army corps, to which it belonged.

Description of the System.—Each army corps had a distinctive badge or device; the Second Corps a trefoil; the Sixth a cross, etc. The shape of the flag and the arrangement of its colors indicated the arm, brigade and division.

The flag of the headquarters of an army corps was shaped like a two-pointed pennant, with a blue field bearing the corps' device in white.

The flag of a division was square in shape; that of a brigade, triangular; each bore the corps' device.

By varying the colors of the field and device, the numbers of divisions and brigades was indicated.

The flag of the first division had a white field and a red device; that of the second, a blue field and white device; of the third, a white field and blue divice.

The colors of the field and device of the flag of a brigade were the same as those of that of the division to which it belonged.

The flag of the first brigade had a plain field; that of the second had a bar along the pike of a different color from either the field or device; that of the third was bordered and that of the fourth, tipped at the angles with the same color as was used for the bar on the flag of the second brigade.

Suppose a soldier, who has strayed from his proper command, sees floating over a tent a triangular shaped flag, with a blue field bearing a white trefoil, and with the angles tipped with another color, he would know that there was the headquarters of the fourth brigade of the second division of the sixth corps.

Flags and Guidons of the Different Arms.—Distinctive standards are also used to indicate the different arms. The special flag of the artillery was triangular, with a red field and a white device. But in case of the reserve artillery,

which belonged to no particular corps the flag had a red field and the device was always white crossed cannon. The shape of the headquarter flag was determined by the nature of the organization, whether a corps, division or brigade.

The standard of the Quartermaster's Department was a two pointed pennant with a red field, crossed by blue bars and bearing the device in white. That of the Subsistence Department had a green field; of the Medical Department, a yellow field; of the Inspector General's Department, a white field; and that of the Adjutant General's Department, a blue field.

This system of distinctive flags, which seems complicated, was in practice so very simple that every soldier soon became perfectly familiar with it.

CHARACTER OF THE AMERICAN ARMY.

Character of the Soldier.—It is difficult to compare the American soldier with any of the soldiers of Europe. He possesses the good qualities of some, together with the most opposite faults of others. He is tireless on the march, is contented even amidst great hardships, and is resolute in the attack, although dispassionate. He does not require the urging of drum-beat or bugle call; his battles have a somewhat sombre and sinister character. If he thinks his efforts useless, he halts and neither orders nor exhortations can induce him to advance. Once engaged, he is tenacious even to rashness and disobedience; he neither wishes nor knows how to retire, and thousands of lives have been lost when a quietly executed order for retreat would have limited the loss to several hundred. Neither complaints nor groans are heard in the long columns of ambulances bearing the mangled and as yet unbandaged wounded from the field of battle. The death of the American soldier is always stoical; he may ask you to give him a little water or to place him in a more comfortable position, but he will wait patiently.

And yet, though apparently indifferent, he is susceptible to enthusiasm. At the battle of Chancellorsville, General Humphreys, a major of topographical engineers, who had become a general of volunteers, wished to lead his division again to the attack, after it had been several times repulsed. The division consisted of Pennsylvania troops, whose three months of service would end on the next day.

The poor fellows, depressed by their previous failures and perhaps thinking of their coming freedom, would not get up and were deaf to the threats and supplications of their commander. The latter thereupon dismounted and, accompanied by his son, a lad but sixteen years old, moved rapidly towards the enemy. The Pennsylvanians were ashamed at the sight and, rushing forward, captured the position.

During the attack on the heights of Fredericksburg, General Meade, another officer of topograpical engineers, who commanded the right wing, had pierced both of the enemy's lines and nearly reached his trains. At this point his soldiers, perceiving that they were alone and that the center and left had been repulsed, took to their heels and fled in disorder. General Meade made vain efforts to reform them between the first and second lines, and furious at their conduct, charged upon them and broke his sword over their heads. One month later a deputation of these very soldiers presented itself at the general's tent and begged him to accept, in exchange for the weapon which he had lost through their disobedience, a magnificent sword which they had obtained by a subscription of no less than eighteen hundred dollars. Upon the guard was engraved the date and place of the battle.

Discipline.—At the core, and in all that is essential, the discipline of the American army is as good as, if not better than, that of European armies; but it has not the external marks, and an observer who merely passes through the American army may thus be deceived. The very fact that these immense levies have either elected their officers or obtained them by appointments made by the local authorities, has transferred the social hierarchy to the army and made it also the military hierarchy. There has therefore been no need for surrounding it with all those precautions which are necessary for the preservation of a hierarchy which has no other foundation than the severity of the reg-

ulations. Few troops are as obedient to their commanders, and during the entire war, although more than two million soldiers entered the ranks, there were only seven military executions.

Selection of Officers.—Although the severity of the system of examinations has corrected the errors arising from a system of election of officers, it was greatly aided by the presence, in all the walks of civil life, of a great number of former cadets and graduates of West Point. Never was there a more thorough proof of the words of President Monroe, that "a military school is needed, not only to supply officers for the army, but to supply in each generation a certain number of citizens learned in the science of war and charged with the duty of spreading its knowledge throughout each of the states."

Too few in numbers to lay claim to the exclusive privilege of the defence of the country, too thoroughly imbued with the duties of citizenship to aspire to other rights than that of serving, the regular army placed its organization and its personnel at the service of the volunteer army. Aptitude was the sovereign rule in the selection of officers.

The corps of engineers, the most scientific body in the army, alone furnished more than twenty general officers, among whom were Humphreys, Pope, Warren, Hooker and Meade. A colonel of engineers, Meigs, became quartermaster general and during the entire war directed the operations of his department with a skill that could hardly be surpassed. General Hancock was only a captain and quartermaster. It was a captain of infantry, Sheridan, who commanded the greatest cavalry expedition during the war, the raid in Virginia, which alone would have sufficed to bring him lasting glory, if the Shenandoah campaign had not associated his name with even greater works and more decisive victories.

The Graduates of West Point.—From all parts of the Union graduates of West Point hastened to offer to the government.

the service of their military knowledge acquired at West Point and of their knowledge of business acquired in the struggles of civil life. The most celebrated of these were Grant and Sherman. The former had been a captain of infantry, had resigned after the war with Mexico, and had been a poor man working in the small industrial establishment of his father-in-law, in Illinois. The latter had been an officer of artillery, had tempted fortune in Missouri and California sometimes as a lawyer, sometimes as a banker, and at the outbreak of the war was in charge of a military college in Louisiana. In a celebrated letter he spurned the offers of the rebels and hastening to the North, offered his services to the Union. The former has become President, the latter is general-in-chief of all the armies of the republic. Their comrades have witnessed their successes with no other sentiments than pride.

In many other cases the companion or subordinate of the past has become commander, yet nobody complains and all consider the greatness of the services rendered rather than that of the reward. If the transferrence of the social hierarchy has maintained discipline among the soldiers, the habit of obedience to the law and of considering it a sufficient guaranty against the caprices of power has prevented among the generals any idea of insubordination.

Subordination of Officers.—An unsuccessful general lost his command and returned to civil life or took service under the orders of a comrade from whom was expected either greater skill or greater success. If, however, his lack of success was not due entirely to fortune, he was tried by a court-martial which either acquitted him or dismissed him from the army. A general had the right to demand trial by by court-martial to defend himself against unjust public opinion or against the accusations of persons prompted by malice or jealousy.

The President is the commander-in-chief of the army and navy of the United States, and all cheerfully obey this

lawyer from Illinois who began life as a splitter of rails. Another lawyer, Stanton, was the all-powerful Louvois of this great war, which lasted five years, which required the levying of more than two million soldiers and which cost more than two and a half billions of dollars.

Military Instruction of the Soldiers.—Patriotism, devotion and discipline could not entirely atone for lack of military knowledge, which the American soldier had to acquire on the field of battle, sometimes at great cost. He learned only such military knowledge as was needed in the kind of war he was making; little versed in those great movements of parade which make of troops the mobile and docile instruments of the tactician, he exhibited a certain unwieldiness which would be disastrous to him if operating against European troops in a European theatre of war. But one would seek in vain in America for plains like that of the camp at Châlons, where so many armies have clashed as if in an arena prepared in advance. A forest, then clearings scarcely large enough for the deployment of a few divisions, then again the forest; such is the nature of the usual terrain of the battle fields of the war. At the Wilderness the two armies fought for three days amidst an almost impenetrable forest; only once was the clearing large enough to permit the use of cannon. An aide-de-camp of General Meade, who, during these three days, was continually engaged, never once saw an entire regiment assembled.

Skill in Intrenching.—Such a war necessarily develops the intelligence of the soldier. At the beginning of hostilities, it was with great difficulty that the soldier could be made to use the pick and shovel, a kind of labor for which he had not enlisted; but he soon saw the necessity for it, and with customary American intelligence in all kinds of skilled labor, he soon became master of the art of using cover. Hardly has the army halted, with its bivouac not yet completed, before it is intrenched without waiting for the engineer officer; and when the latter arrives he finds

few things that need rectifying; the lines are defiladed, the traverses are well placed, abattis is prepared, the vedettes are placed in small trenches which furnish them perfect cover; the army is secure against surprise, and all this often without any other tool than the settlers' axe which the American is rarely without and which he uses with great skill, and without anything to use as a shovel except the wrought iron cup, which hangs alongside the canteen. If the position has to be held, all these rough works are perfected and lines and redoubts are built which are quite as artistic as the best of military constructions. All arms are equally skillful and the cavalry rivals the sappers of the engineers.

Gettysburg.—The battle of Gettysburg was perhaps the only battle in which the Federal army, had to resist the shock of the Confederates, without being intrenched; it showed on this occasion great solidity. The attacks of the Confederates were so furious that those who were not crushed by the artillery fire fell exhausted in the midst of the Union ranks. This was also the only battle which can be compared to those of European wars; the cause of secession never recovered from this defeat which really saved the Union.

Order of Attack.—The attack is usually made in lines, rarely in column, although this formation gives both spirit and solidity to the assailant. At Spottsylvania there was an attack in column which succeeded, but several days afterwards, General Smith tried to repeat the manœuvre on the Chickahominy, but he was struck on both flanks and defeated; the column formation was not again employed. Moreover, the success at Spottsylvania was somewhat the result of a surprise; when the lines are well defended they are very strong and their capture by assault costs a great many men.

Manœuvres to Turn Positions.—Spottsylvania, Cold Harbor and Petersburg were very bloody battles without decisive result. It was necessary therefore to manœuvre so as to find the enemy unprepared, in other words to turn the positions.

The whole of the first part of Sherman's campaign as far as Atlanta is a masterpiece of this kind of manœuvre. He was opposed by Johnston, the best general of the Confederates and an opponent worthy of him. The campaign presents a series of marches and countermarches which can not be studied too much by any soldier who is interested in his profession.

The Signal Corps.—In such a war, to possess accurate information is a matter of utmost necessity, and the Signal Corps has therefore acquired great importance. Its errors have had the most terrible results. Owing to the splendid manœuvre by which Grant left Lee on the left bank of the James waiting for him at Malvern Hill while Grant was crossing his whole army over the river, General Smith was enabled to capture the first lines of Petersburg. The signal corps announced the arrival of Beauregard; he halted, hesitated and remained inactive for forty-eight hours, notwithstanding the arrival of reinforcements sent by Hancock; and when Meade with the whole army, three days afterward, renewed the attack it was too late and ten thousand men were uselessly lost in three hours. The signal corps had made a mistake and the Confederate reinforcements had in reality arrived only a few hours before Meade.

Such errors are rare, however, and this case has become celebrated because of its result, which perhaps prolonged the war a year. We have already related how, during the campaign in Virginia, a report was captured which was made by the Confederate signal corps with reference to the passage of an army corps which it was thought had moved without the enemy's knowledge; the report was found to be correct in every particular and the strength of the corps was given exactly.

The Raids.—To pass within the lines, or make a long detour against the rear of an enemy in strength and in a good position, to destroy his communications, and burn his supplies,—such is the object of the raids which have been

considered so important in this war. These raids are cavalry expeditions, in which however the horse is only considered as a means of transport expected to be worn out. They consist of long continuous marches, avoiding being overtaken by the enemy, and the raiding force often rejoins the army at a great distance from the point of starting. It lives upon the country as best it may and destroys everything in its path, stations, railways, bridges and magazines. It comes like the lightning and disappears as quickly.

The most famous of these raids was that of Sheridan in Virginia; it assumed the proportions of a small campaign. Upon the 8th of May, he left the army which was marching on Spottsylvania, taking with him 10,000 cavalry formed in five divisions, each regiment consisting of only 250 men, twenty pieces of light artillery and a canvas pontoon equipage, with no rations other than those in the knapsack. He threw his force rapidly between Lee and Richmond, which city Lee was covering against the march of Grant, recaptured 300 Federal prisoners, and upon the 11th reached Ashland Station only five miles from Richmond. One of his detachments reached the first lines, only two miles from the heart of that city, but he was overtaken by J. E. B. Stuart, the inventor of the raids, who was overthrown and mortally wounded. On the next day, he retreated toward Meadow Bridge, which had been destroyed, and saw a body of Confederates on the opposite bank. He was informed by signal of the approach of another Confederate force in his rear. Without hesitation he rebuilt the bridge under fire of the enemy, crossed it and defeated the Confederates, and then recrossing it, defeated the forces which were closing in upon him from all sides and which had considered his capture certain. Two days after he joined Butler's corps, participated in the battles of Cold Harbor and the Chickahominy, and again left the army destroying the Virginia Central railway, fighting a battle at ——, continuing his immense destruction of stations and supplies, and after a last terrible battle which rendered the enemy unable to

molest him thereafter, he joined the army at Spottsylvania Court House on the 14th of June, with all his wounded and all his wagons. But he brought back only 600 horses, entirely unfit for further service; the rest were dead, more than one-third of the horses having died of thirst. The expedition lasted thirty-six days.

All the raids did not have as favorable a result. That of Hunter in the Shenandoah Valley, after having destroyed the magazines at Staunton and threatened Lynchburg, was obliged to hastily withdraw into West Virginia, with a loss of 600 men and nearly all its artillery. General Wilson was sent to the left of the lines of Petersburg to cut the railroads. He succeeded in this but was surrounded by a large force of infantry, and was able to escape with only 3,000 cavalry, scarcely half of his force, abandoning his artillery, his prisoners, and 2,000 unfortunate negro refugees who were driven back with strokes of sabre and lash to Richmond and sold at auction.

Notwithstanding the great popularity of raids in America, their utility may be questioned. When an army is too weak to successfully oppose its enemy, there can be no better course than to divide it into small mobile forces acting separately, annoying the enemy on all sides, cutting his communications, destroying his supplies, and thus preventing him from taking advantage of his superiority. But in the midst of serious operations, to detach a considerable force to make a diversion which usually is not an appreciable factor in the final result, is an operation of doubtful utility. Had Sheridan's force been with Grant at Spottsylvania, a decisive victory might have resulted. Moreover, the damage resulting from the destruction of railways is often more apparent than real. After Wilson's disaster, the Federal forces felt consoled by the fact that his expedition had destroyed the Danville railroad; eight days later it was again in operation.

Tenacity of the Generals.—This liking for adventurous expeditions, which would seem to indicate a certain impatience

with the rules of war, is, however, combined with rare tenacity and steadfastness. Grant's operations before Vicksburg and his persistence in remaining before Petersburg, notwithstanding the alarm of the government at the threat against Washington by Early's great raid, are the most memorable examples.

Firmness of the Nation.—The nation has shown an unshaken firmness of desire to continue the war, equal to that of the generals in carrying out their military plans. Never has a people subjected to such a test shown greater power to resist discouragement. When the first army had been completely destroyed at Bull Run and its material ruined, the nation responded to the joyous shouts of the enemies of liberty in both hemispheres by the levy of more than 600,000 volunteers. And when at last fortune favored the Union forces, the Confederates, who are only a portion of the same nation devoting the same virtues to an evil cause, gave evidence of equal perseverance.

Every success seems only a useless sacrifice. Although defeated at Antietam in 1862, Lee again crossed the Potomac, ravaging Maryland and Southern Pennsylvania, and when he had again been defeated at Gettysburg, he retired into Virginia, reorganized his forces and seemed more formidable than before. New Orleans was captured in 1862, Port Hudson and Vicksburg in 1863; the Mississippi was thus opened from Saint Louis to the sea. The Confederates, however, were victorious at Chickamauga, forcing the Federal army to remain inactive at Chattanooga, and Bragg, reinforced by Longstreet, threatened a recapture of Tennessee. Thus each victory led to a new demand for money and men; 511,000 men in 1861, 600,000 in 1862, 400,000 in 1863, 1,285,000 in 1864.

Sympathy for the South.—The factions sympathizing with the South were more dangerous enemies to the Union than even the Confederate armies. Every disaster gave them renewed hope of regaining the power which they had lost at

the elections. They continued to spread discouragement, and even created riots in the large cities. When the time came for the Presidential election, in 1864, Richmond had not yet fallen and nothing was known about the state of Sherman's army. These sympathizers urged that the only results of all the bloody campaigns, were that Grant had lost 100,000 men and was no nearer success than McClellan had been in 1862, and that Sherman's army was lost. They claimed that the rebels were soon going to regain the West; that Mobile, Savannah, Wilmington and Charleston were always open for assistance from Europe; that there were 100,000 deserters; that the people were everywhere resisting the recruiting officers; that widows and orphans were everywhere to be seen; and that the country was unwilling to continue the war. They asserted that the war was continued only to satisfy the ambition of a few men who had caused the war; that peace could be obtained on reasonable conditions; and that if the conditions were afterwards found unsatisfactory, the country would be better able to renew the war after recoving from its ruined condition, than to continue it at that time. Democratic newspapers and radical German journals, impudently trying to teach lessons of liberty to the descendants of Washington and Franklin, spoke of Lincoln as a dictator, a tyrant, a Nero, a Tiberius, a Heliogabalus.

The people of the Union would not listen to their arguments. They knew that a peace, which was not the result of victory, would be only a truce and would be followed by unending wars. They were unwilling to leave to their children the duty of revenging the defeat of a cause which they had themselves deserted. Lincoln was re-elected with a great majority. The reward was worthy of such devotion; the Union was preserved and the United States now contains an undivided people, cherishing the same institutions that were bequeathed to them by their forefathers.

Generosity of the Conquerors.—The victory was merciful, because it was a triumph of justice. It was not stained by

reprisals, nor by those summary executions which dishonor the best cause and trouble the conscience of History when she renders her solemn judgment. And yet the conquered people had been rebels, who for five years had flooded the country with blood; they had torn down the national flag, pillaged the arsenals, seized government property, had falsified the election returns so as to obtain power with a minority. They had, by pitiless executions, forced loyal men to fight in their armies; had executed hostages in retaliation for the just punishment of their spies; had starved to death 12,000 prisoners in their prison at Andersonville; had cruelly massacred in cold blood the unfortunate garrison of Fort Pillow after they had surrendered without resistance; had burned the open city of Chambersburg and had destroyed captured cities. Columbia had been totally destroyed; three-fourths of Charleston and two-thirds of Richmond were in ashes. They had committed all these crimes, and one still greater crime than any of these: they had rebelled against the laws of a free country.

And yet, when after the surrender of Lee, President Lincoln, a man so tender-hearted that he would not confirm a death sentence, had been assassinated, and when the people had sorrowfully borne his body back to the home at Springfield, which he had quitted for the White House, the generous sentiments of the victors remained unchanged. The people of the South were forgiven; having obeyed their *de facto* government, they were not held responsible. The leaders only were declared guilty, but were pardoned upon condition of renewing the oath of allegiance to the Union which they had betrayed.

Result of Victory.—If the Federal government had consented to make a treaty of peace with the rebels, that peace would have condemned America to the maintenance of standing armies and to lasting debt like the states of Europe. The peace which resulted from victory enabled the Union to liquidate its debt, and to preserve intact its liberal institutions by disbanding its immense army.

Disbandment of the Army.—The work of mustering out the armies began after the great review of the armies of the West and the Potomac in Washington on the 29th of May. The volunteer army then numbered 1,034,064 men; before August, 640,800 had been mustered out and paid and had returned to their homes; before November, this number had been increased to 800,800. The 73,442 Confederate prisoners were released after having taken the oath of allegiance. The 174,233 prisoners surrendered at the final capitulations, were permitted to return to their homes. The sick were the first to profit by the right to return home; there were 64,438 undergoing treatment, and in June, 1865, this number had been reduced to 97. Only 264 assistant surgeons were retained in service. The force of 230,000 men which had been prudently retained in service, had been, in June, reduced to 11,043, who formed the contingent of the regiments of colored troops.

The immense supplies of all kinds were sold and all contracts for furnishing supplies were annulled; 207,000 horses and mules were sold, yielding $15,689,075.54. The 590 ocean transport vessels, which cost $82,400 a day, were reduced to 53, costing only $3,000 a day. The vessels, barges and steamers, used in river navigation, were sold as soon as they were no longer needed to carry troops to their homes. The military railways, with their engines and cars, were returned to the companies, according to the agreements made in the early part of the war. Of the corps of military telegraphers, only a few employes were retained for service in connection with the cipher despatches of generals; all the telegraph material was sold. The Signal Corps disappeared entirely. The Subsistence Department disposed of its supply of rations; surplus medicines and hospital property were sold for $4,044,261.59. All engineer works ceased, except the construction of sea-coast defenses. The Ordnance Corps reduced the number of arsenals to five, but kept on hand a million good small-arms and supplies for a

large army, and continued zealously to study how to improve all the material of war.

The soldiers, upon returning to their homes, were permitted to take their arms upon payment of a small price. It was thought that the sight of these arms would recall to future generations how their ancestors had fought for the preservation of the Union.

Reorganization of the Regular Army.—The number of territorial departments were definitely fixed at nineteen, and a reorganization of the army was made. Its strength before the war had been only 14,000, and it had decreased owing to the eagerness of the people to enter the volunteer army, and to the law forbidding any further enlistments. As reorganized, it consisted of ten regiments of cavalry of twelve companies, five regiments of artillery of twelve batteries, and forty-five regiments of infantry of ten companies.

Two of the cavalry regiments and four of the infantry regiments were composed of colored troops. Four regiments of infantry were composed of disabled soldiers, mostly men who were maimed, who did not wish to be discharged; they were intended for duty in hospitals, storehouses and other similar duties.

The maximum strength of a company was fixed at one hundred, the minimum at fifty. This would give, including officers, a total strength varying from 43,882 to 75,382. The total strength was limited temporarily to 54,302; the company to sixty-four men, and a field battery to one hundred and twenty-two.

This great increase in the strength of the regular army, afforded an opportunity to reward volunteer officers who wished to remain in the military profession. It was imposed as a condition, that an applicant for commission must have been two years in active service and must be examined by a commission, which should determine their proficiency and recommend them for such grade as they were worthy of holding.

Rewards.—All officers of volunteers retain an honorary title; before the disbandment of the army many promotions were made to reward in this manner services which, being no longer necessary, were in danger of being forgotten. These honorary titles do not affect the order of rank in the regular army, although many of its officers possess them; a captain may command a company, with the title of colonel, or a colonel his regiment, with the title of general. In civil life everybody returned to his trade or profession.

A European, who retains some federal prejudices, notwithstanding numerous revolutions, may at first smile at seeing a general employed as a lawyer, banker or shopkeeper; but if he recognizes in the shop-keeper a general who, at Gettysburg, gallantly led his division, or who served faithfully through four years of bloody war, without once returning to his home; his smile will be followed by admiration, not entirely free from envy, for this country, whose citizens feel that they are doing their own work when fighting during war quite as much when working during peace.

Such ideas might have led to ingratitude, but such is not the fact; whatever the government could do to lessen hardship and suffering, it has done generously. Widows, orphans and those who are unable to work because of wounds, receive pensions; those who are not so severely injured receive abundant assistance. Offices have been established in every State for the examination of claims against the government; during one year more than a million claims have been examined and adjusted.

The dead have not been forgotten. The bodies of 249,397 soldiers, who died in their country's service, have been placed in forty-one national cemeteries, each of which is superintended by a disabled veteran. Each grave is suitably marked with the name of the soldier. The names of the dead were published in the official reports of the war. The graves of the unknown dead are also suitably marked.

In the cemetery at Andersonville, upon the site of that horrible prison, in which 12,912 prisoners died of starvation and suffering, there are 451 headstones upon which no name could be placed. They are inscribed, "An unknown Union soldier." Congress devoted $2,754,085 to this sacred duty.

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