
U. S. Infantry & Cavalry School,

FORT LEAVENWORTH, KANSAS, JUNE 30, 1897.

H. S. HAWKINS,

Colonel, 20th United States infantry, Commandant.

Annual Report.

7 Appendices.

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UNITED STATES INFANTRY AND CAVALRY SCHOOL,

Fort Leavenworth, Kansas, June 30, 1897.

The

Adjutant General, U. S. Army,

Washington, D. C.

SIR:—

I have the honor to submit the following report of the operations of the U. S. Infantry and Cavalry School for the second school year commencing September 1st, 1896, and ending with the graduating exercises on June 15th, 1897.

The student class which completed the course at the school was composed of the following named officers:

2nd Lieutenant William M. Crofton,	1st Infantry,
2nd Lieutenant Peter E. Marquart,	2nd Infantry,
1st Lieutenant John C. Gregg,	4th Infantry,
1st Lieutenant Paul A. Wolf,	4th Infantry,
2nd Lieutenant Guy H. B. Smith,	4th Infantry,
2nd Lieu tenant John F. Madden,	5th Infantry,
Captain Edgar Hubert,	8th Infantry,
1st Lieutenant James R. Lindsay,	8th Infantry,
2nd Lieu tenan t John F. Stephens,	10th Infantry,
1st Lieu tenan t Willis Uline,	11th Infantry,
2nd Lieutenant Herbert O. Williams,	11th Infantry,
1st Lieu tenant William N. Hughes,	13th Infantry,
2nd Lieutenant George McD. Weeks,	15th Infantry,
2nd Lieutenant George D. Guyer,	16th Infantry,
1st Lieutenant James T. Kerr,	17th Infantry,
2nd Lieutenant Joseph Frazier,	19th Infantry,
1st Lieutenant Frank D. Webster,	20th Infantry,
2nd Lieutenant Robert W. Mearns,	20th Infantry,
2nd Lieutenant William M. Morrow,	21st Infantry,

2nd Lieutenant Orrin R. Wolfe,	22nd Infantry,
1st Lieutenant John R. M. Taylor,	23rd Infantry,
2nd Lieutenant Thomas F. Schley,	23rd Infantry,
2nd Lieutenant Harrison J. Price,	23th Infantry,
1st Et. Vernon A. Caldwell,	Infantry, (unassigned),
2nd Lieutenant George P. White,	3rd Cavalry,
2nd Lieutenant James H. Reeves,	4th Cavalry,
2nd Lieutenant Powell Clayton, Jr.,	5th Cavalry,
1st Lieutenant John M. Stotsenburg,	6th Cavalry,
1st Lieutenant Edward Anderson,	7th Cavalry,
2nd Lieutenant Frank Tompkins,	7th Cavalry,
2nd Lieutenant George W. Kirkpatrick,	8th Cavalry,
1st Lieutenant Charles J. Stevens,	9th Cavalry,
1st Lieutenant William H. Smith,	10th Cavalry.

The class originally reported with thirty-five members. Of these officers one was relieved from duty at the school to enable him to accept position as regimental quartermaster and one was found incapable of completing the course.

The class has shown ability and through its efforts progress has been attainable in the development of the school.

The following named officers are recommended by the staff to be declared "Honor Graduates" of the school :

1st Lieutenant Edward Anderson,	7th Cavalry,
2nd " Guy H. B. Smith,	4th Infantry,
2nd " Herbert O. Williams,	11th Infantry,
1st " William H. Smith,	10th Cavalry,
1st " James T. Kerr,	17th Infantry.

For a synopsis of the work done in this last year, attention is invited to the accompanying report of instructors in charge of the several departments.

CHANGES IN SCHOOL REGULATIONS.

After mature deliberation it has been determined to submit for approval a revision of the regulations by which it will appear that some important changes are recommended, chief among which is the proposed plan of doing away with the Department of Infantry, the Department of Cavalry

and the Department of Artillery and consolidating these with the Department of Military Art as suggested in my annual report for 1896. If approved and authorized the school will then be divided into five departments instead of seven as now constituted and they will be known as the Departments of Tactics, Strategy, Engineering, Law, and Hygiene.

The proposition has been discussed to do away with the Department of Law because its course is much of a repetition of that gone over at the Military Academy or required from candidates for promotion.

It is contemplated however to gradually enlarge this course on the lines indicated in my last annual report by citing for solution supposable cases in international questions which might require immediate action by an officer. It is also intended to intrust this department with the kindred subjects of military administration embracing all the business departments, quartermaster, commissary and ordnance, and to develop something of their practical features in problems of rapid supply during supposed active field operations.

MOUNTS FOR STUDENT OFFICERS.

Fortunately for cavalry officers detailed in the next class, transportation is to be furnished by the government for their horses from present station to Fort Leavenworth, so that for the large amount of work to be done in the saddle during the school course the cavalry officer will have the benefit of a mount to which he is thoroughly habituated. Under existing conditions the infantry officer has to depend upon the cavalry troops stationed at Fort Leavenworth and it is not always practicable to furnish the same mount daily. This results in trouble all around, to the student officer, to the troop commander and to the soldier whose horse is taken for such extra work. Attention is invited to the following remarks taken from the report of the Instructor, Department of Engineering :

‘Another recommendation I would make is with reference to horses. The proposed school regulations contemplate a

more extended course in mounted work in the subjects covered by the department of tactics and it is believed that this department would be much benefitted as well were it practicable for each officer to have his own horse for use on duty. Two methods of attaining this suggest themselves. The first is to have a school detachment of horses and men. Thirty horses and a detachment consisting of two non-commissioned officers and ten enlisted men to be known as the U. S. Infantry and Cavalry School Detachment of Cavalry would be ample for the purpose. The Secretary of the school could command the detachment. The men need have no arms issued to them and when not required for other duty, they could be used as a police detachment for the school and arsenal grounds thus relieving the garrison troops of much fatigue duty. They could be assigned to the companies serving at the post for quarters and rations."

"The second method, and probably the more feasible one, would be to transport the horses of mounted student officers from their stations to the school, to give each Infantry officer (instructor and student) mounted pay and forage during his course and then require *all* to ride their own horses."

"The subject is one worthy of serious consideration and I believe one or the other of the above propositions would be of distinct benefit to the school. Mounted work would then be carried on more assiduously because the heads of departments would have no hesitation in making use of the horses more frequently than now when each animal is assigned to and ridden by a trooper as well by the student."

NECESSITY FOR INCREASE OF MONEY ALLOWANCE.

Attention is invited to the following remarks taken from the report of the instructor, Department of Engineering :

"One of the greatest needs of the school at the present time is a more liberal appropriation for its support. The department of engineering has received its full share of the \$ 1500.00 annual allotment to the school and yet it has been impossible to furnish all the instruments and material desired.

“There is urgent need, in order to properly carry out the course to begin September 15, 1897, of another Surveyor’s Compass and a Y-level as well as a Saegmuller Solar Attachment for the transit, also a complete outfit (40 each) of steel rulers and triangles. Many of the smaller instruments such as clinometers and compasses have been in use for a number of years and should be replaced by new ones. It is estimated that \$ 450.00 could be judiciously expended at once on new instruments beside that necessary for the ordinary repairs incident to two years field use”.

The following is a list of Instruments the use of which is taught both practically and theoretically:

Chains,	Leveling Rods,
Steel Tapes,	Sextant,
Scales of Equal Parts,	Range-Finders:
Odometers,	Pratt,
Engineer’s Transit,	Green,
Same with Stadia wires &c.	Gordon,
Same with Solar Attachments,	Labbez,
Compass, Surveyor’s	Weldon, (Two forms)
“ Box,	Souchier,
“ Prismatic,	Watkin,
Protractors,	- -
Plane Table,	Tallying Register,
Wye Level,	Clinometer,
Slope Board.	Field Sketching Case.

Instruments taught only theoretically:

Wheelbarrow Odometer,
 Pedometer,
 Cyclometer,
 Aneroid Barometer.

All cameras, lenses and other attachments used in Photography are taught both theoretically and practically.

All student officers are required to become familiar with the principle upon which each instrument is constructed and

to practically apply in the field what is learned in the section room. This involves the frequent use of large numbers of the instruments and incidentally the repair or purchase of new ones.

The constant purpose of the Department is to increase practical work and if this is not to be discouraged the increase of cost must be met.

There can be no doubt that work in the field with the instruments is essential and that no amount of theory will take its place. The students are required to both learn and practice and this is done with the approval of the War Department.

Were there no student officers, no extended course of topography and no practical use of instruments in military surveying, the Infantry and Cavalry School would be surprised to find itself allotted the second and larger share from a lump appropriation for the three service schools. But the student officers are detailed, they are all required to become proficient in the course and there is constant practical use of expensive instruments; yet the Infantry and Cavalry School receives \$ 3500 less than Fort Monroe and \$ 500 less than Fort Riley where there are no student officers and consequently no practical application of it previously studied theoretical course.

If the performance of ordinary garrison duty with incidental drills and field exercises constitutes a service school, then there are two service schools at Fort Leavenworth, one established by regulations and known as the Infantry and Cavalry School, and the other constituted by the presence of a larger number of organizations than are at any other post in the army and doing practical field work with the post proper and with the Infantry and Cavalry School.

The request for greater allowance of funds is earnestly renewed.

LIGHT BATTERY.

In practical field exercises during which the whole enlisted force of the garrison is officered and controlled by student officers under the observation of the instructors, it is impracticable to make the imaginary presence and maneuvering of field batteries at all correspond to what would be the case in the actual use of rifled guns.

If a field battery with its entire personnel cannot be stationed here it is requested that necessary action be taken to provide six of the modern guns with necessary equipment and harness, and that forty-eight horses be furnished for the field work,

Very respectfully,

H. S. HAWKINS,

Colonel, 20th Infantry,
Commandant.

APPENDIX A.

UNITED STATES INFANTRY AND CAVALRY SCHOOL, SECRETARY'S OFFICE,

Fort Leavenworth, Kansas, June 30, 1897.

The Commandant,

U. S. Infantry and Cavalry School.

SIR:—

I have the honor to submit the following report pertaining to the school as secretary and disbursing officer.

I assumed charge of the office on August 20, 1896, relieving 1st Lieutenant Charles W. Penrose, 11th Infantry.

The fifteen hundred dollars (\$1500.00) appropriated for the school has been expended as follows :

Library :	Books of reference for the several departments, and scientific papers and periodicals.	\$312.46
Department of Engineering :	Purchase of instruments and materials.	554.90
	(\$238.87 of this amount is for the purchase of drawing tables, used by all departments).	
Department of Military Art :	Purchase of materials for making and mounting maps.	74.39
Printing Office :	Purchase of paper, ink, printing materials, etc., including extra duty pay to enlisted men employed as printers	420.45
Stationery, office and section room supplies, including diplomas for graduating class		137.80
	Total	<u>\$1500.00</u>

Two thirds of the entire printing for the year which amounted to \$420.45 should be charged against the Department of Military Art, which makes the allotment to this department really \$354.69 instead of \$74.39 as above given.

It is urgently recommended that a more liberal appropriation be made in the future as it will be impossible to purchase many needed instruments out of the sum allotted for the next fiscal year. Many of the instruments are expensive, and being old, cannot be used much longer, even with constant repair and close attention.

The necessary printing for the school which constantly increased, has been done for less than 3 cents per 1000 ems. It is recommended that a small hand binding plant be added to the printing establishment so that larger pamphlets than those of from 50 to 60 pages can be bound at the school. This would also be of service in keeping the books of the library in repair. The following is a partial list of the work done during the year, it being impracticable, owing to the variety and great number of jobs, to enumerate any but books and pamphlets here.

Strategical Operations.

Marches and Supply.

Military Policy and Institutions,

Pronunciation Dictionary, Strategical Operations.

Synopsis of the Conduct of War.

Questions in Strategy,

Questions in the Conduct of War.

An Historical Sketch of Permanent Fortifications.

The first named has become an authorized text-book at the school, replacing Hamley's "Operations of War"; the second has taken the place of Home's "Précis of Modern Tactics", or so much of it as is now used in the course.

These books and pamphlets have been printed as provided for in paragraph 54 of the school regulations, and have been distributed to all members of the class, instructors, various service schools, libraries. etc.

Many requests are constantly received from officers of the army and national guard, asking to be supplied with the school publications. They are distributed so far as they will reach but it is impossible to furnish to all who ask for them, unless a more liberal appropriation is made with which to purchase the necessary material.

Forty six bound vols. and numerous pamphlets have been added to the library at a cost of \$213.00. Many more would have been purchased had the necessary funds been available.

The library has been presented with five bound vols. during the year by the following persons:

Mr. W. H. Patterson, 2 vols. Mr. A. P. Stokes, 1 vol. Captain J. S. Pettit, 1st Infantry, 1 vol. 1st Lieutenant W. A. Campbell, 22nd Infantry, 1 vol.

The library is indebted to General A. W. Greely, U. S. Army, for numerous works received during the year ; also to the Director of the Geological Survey, and the Superintendent of the Coast and Geodetic Survey, for numerous maps and charts which were kindly furnished free of charge.

Under the provisions of General Orders No. 80, A. G. O., 1890, this office has continued to furnish officers of the army and national guard with military text and reference books.

The school plant for photographic work could, with but slight expenditure in modification, be made of considerable use to officers throughout the army during the lyceum course, in preparing bromide enlargements of maps used in the discussions before lyceums. This could be done for the officer by simply charging for the price of material.

Very respectfully,

JAS. S. ROGERS,

Captain, 20th Infantry,

Secretary.

APPENDIX B.

UNITED STATES INFANTRY AND CAVALRY SCHOOL,

DEPARTMENT OF MILITARY ART,

Fort Leavenworth, Kansas, June 30, 1897.

The Secretary,

U. S. Infantry and Cavalry School,

Fort Leavenworth, Kansas.

SIR:—

I have the honor to report as follows concerning the course of instruction and the methods pursued in the Department of Military Art during the school year 1896-1897.

PERSONNEL OF THE DEPARTMENT.

At the beginning of the school year the following officers were on duty in the department :

1. Captain A. L. Wagner, 6th Infantry.
2. Captain Eben Swift, 5th Cavalry.
3. 1st Lieutenant J. T. Dickman, 3rd Cavalry.
4. 1st Lieutenant A. L. Mills, 1st Cavalry.

Captain Swift was relieved February 19, 1897; 1st Lieutenant J. F. Morrison, 20th infantry, was assigned March 10, 1897; Major A. L. Wagner, A. A. G., was relieved March 23, 1897.

. SUBJECTS STUDIED.

The general subjects studied embraced Tactics, Strategy: Logistics, Military History and Military Geography. Instruction was imparted by means of recitations, lectures, map maneuvers, war games and practical exercises with troops.

The time allotted to the department consisted of 13 half-days in the autumn term, and 94 half-days in the spring term; it was utilized as follows:—

Recitations in "Marches and Supply,"	9
Recitations in "Question Sheets on Strategy,"	3
Recitations in "Conduct of War,"	36
Lectures by Major Wagner,	2
Lectures by Captain Swift,	3
Lectures by members of the class,	35
Quizzes on campaign lectures,	10
Field Exercises with troops,	9
	Total 107

SUBJECTS IN DETAIL.

(a) *Tactics.*

No regular recitations were held in this school year, but students were required to review certain portions of their text-books so as to be familiar therewith for the purposes of lectures, war games, and practical exercises. Three lectures by Captain Eben Swift, 5th Cavalry, on "Tactical Problems" may also be considered as instruction under this head,

(b) *Strategy.*

Lecture by Major A. L. Wagner, A. A. G., on the "Principles of Strategy."

Thirty-six recitations in Lieut.-General von der Goltz's "Conduct of War," and three recitations in "Question Sheets on Strategy" (a Department pamphlet).

(c) *Logistics.*

Nine recitations in "Marches and Supply" (a Department pamphlet).

(d) *Military History.*

Thirty-three lectures by students on campaigns of Europe and the United States, as follows:—

1. Campaign in Champagne, 1814,
Captain Edgar Hubert, 8th Infantry.
2. Campaign of 1796 in Italy,
1st Lieutenant C. J. Stevens, 9th Cavalry.

3. Campaign of Novara,
1st Lieutenant J. M. Stotsenburg, 6th Cavalry.
4. Campaign of Metz and Sedan,
1st Lieutenant W. H. Smith, 10th Cavalry.
5. Campaign of 1862, in Virginia,
1st Lieutenant J. T. Kerr, 17th Infantry.
6. Campaign of 1861, in Virginia.
1st Lieutenant W. N. Hughes, 13th Infantry.
7. Moreau's Campaign, 1800,
1st Lieutenant J. C. Gregg, 18th Infantry.
8. Campaign of Eckmühl, 1809,
1st Lieutenant Edward Anderson, 7th Cavalry,
9. * Campaign of Waterloo,
1st Lieutenant J. R. M. Taylor, 23rd Infantry.
10. Campaign of Salamanca,
1st Lieutenant Frank D. Webster, 20th Infantry.
11. Campaign of Ulm, 1805,
1st Lieutenant J. R. Lindsay, 8th Infantry.
12. Campaign of Marengo,
1st Lieutenant P. A. Wolf, 4th Infantry.
13. * Moreau's Campaign, 1800,
1st Lieutenant Willis Uline, 11th Infantry.
14. * Campaign of Novara,
2nd Lieutenant V. A. Caldwell, 25th Infantry.
15. Campaign of 1864, in Georgia,
2nd Lieutenant G. P. White, 3rd Cavalry.
16. Passage of the Ticino, 1859, and Gave de Pau,
2nd Lieutenant Joseph Frazier, 19th Infantry.
17. Campaign of Jena,
2nd Lieutenant G. H. B. Smith, 4th Infantry.
18. Campaign of Vicksburg,
2nd Lieutenant H. O. Williams, 11th Infantry.
19. Combat of Saarbrücken,
2nd Lieutenant G. D. Guyer, 16th Infantry.
20. * Campaign of Jena,
2nd Lieutenant W. M. Morrow, 21st Infantry.
- 20%. Massena's Retreat, 1811,
2nd Lieutenant T. F. Schley, 23rd Infantry.
22. Napoleon's Passage of the Danube, 1809,
2nd Lieutenant Frank Tompkins, 7th Cavalry.

23. *Campaign of 1862, in Virginia,
2nd Lieutenant P. E. Marquart, 2nd Infantry.
24. Passage of the Rappahannock and Rapidan,
2nd Lieutenant H. J. Price, 24th Infantry.
25. * Campaign of Eckmühl.
2nd Lieutenant W. M. Crofton, 1st Infantry.
26. * Campaign in Champagne, 1814,
2nd Lieutenant J. F. Madden, 5th Infantry.
27. * Campaign of Metz and Sedan,
2nd Lieutenant P. Clayton, Jr., 5th Cavalry.
28. Passage of Bull Run,
2nd Lieutenant J. H. Reeves, 4th Cavalry.
29. Passage of the Danube, 1877,
2nd Lieutenant G. W. Kirkpatrick, 8th Cavalry.
30. * Campaign of Vicksburg,
2nd Lieutenant G. McD. Weeks, 15th Infantry.
31. * Campaign of 1864, in Georgia,
2nd Lieutenant R. W. Mearns, 20th Infantry.
32. *Campaign of Ulm, 1805,
2nd Lieutenant O. R. Wolfe, 22nd Infantry.
33. Campaign of Waterloo,
2nd Lieutenant J. F. Stephens, 10th Infantry.

NOTE.—Lectures marked * were delivered a second time.

A compilation entitled "Strategical Operations," by Major A. L. Wagner, Instructor, and other officers of the Department, of a number of important campaigns, many of which were entirely rewritten from Hamley's "Operations of War," served as a model for the arrangement of the matter of these lectures.

The members of the class were questioned on the salient features of these campaigns on subsequent occasions, and the Instructor elucidated points not fully brought out by the lecturer.

In addition to the above, each member of the class was required to submit an essay on the Fort Donelson Campaign, worked out in accordance with the following outline :

1. The military situation at the opening of the campaign.

2. The fronts of the armies, their bases of operations and lines of communication.
3. The successive steps of the military operations.
4. The results.
5. Comments.

(e) *Military Geography.*

Lecture by Major A. L. Wagner, A. A. G., on "The Military Geography of Canada". More or less study of the subject was inseparable from the lectures on the campaigns enumerated, and the quizzes relating thereto.

(f) *Map Maneuvers and War Games.*

Not much was done in this line during the school year just closed. A course of instruction was commenced but it had to be abandoned on account of lack of time.

(g) *Graduating Essays.*

In compliance with the requirements of the School Regulations members of the class submitted their graduating essays on subjects selected by them and approved by the Department, as follows :

1. Infantry: Its History and Equipment,
Captain Edgar Hubert, 8th Infantry.
2. Cavalry against Mobs,
1st Lieutenant C. J. Stevens, 9th Cavalry.
3. An Object Lesson in the Art of War,
1st Lieutenant J. M. Stotsenburg, 6th Cavalry.
4. The Saber and Revolver,
1st Lieutenant W. H. Smith, 10th Cavalry
5. Endurance as a Factor in Military Operations,
1st Lieutenant J. T. Kerr, 17th Infantry.
6. The Recruitment of an Army in time of War and in time of Peace,
1st Lieutenant W. N. Hughes, 13th Infantry.
7. Human Nature and the Science of War,
1st Lieutenant J. C. Gregg, 18th Infantry.
8. Organization and Preparation of a Cavalry Regiment for War,
1st Lieutenant Edward Anderson, 7th Cavalry.

9. The Preparation of a Newly-Raised Regiment for Service in the Field,
1st Lieutenant J. R. M. Taylor, 23rd Infantry
10. Local Combats,
1st Lieutenant Frank D. Webster, 20th Infantry.
11. The Organization and Instruction of a Volunteer Regiment of Recruits,
1st Lieutenant J. R. Lindsay, 8th Infantry.
12. The Supply of Ammunition for Infantry on the Battlefield,
1st Lieutenant P. A. Wolf, 4th Infantry.
13. The Defense of a Harbor,
1st Lieutenant Willis Uline, 11th Infantry.
14. The Preparation of a Volunteer Regiment for Service,
2nd Lieutenant V. A. Caldwell, 25th Infantry.
15. Are Military Ideas Opposed to the Trend of Modern Civilization?
2nd Lieutenant G. P. White, 3rd Cavalry.
16. Discipline,
2nd Lieutenant Joseph Frazier, 19th Infantry.
17. Thirty Years' Progress in Small-Arms and Heavy Ordnance, and its Influence on the Art of War,
2nd Lieutenant G. H. B. Smith, 4th Infantry,
18. The Railroads of the United States considered from a Military Standpoint,
2nd Lieutenant H. O. Williams, 11th Infantry.
19. The Supply of Small-Arms Ammunition in the Field,
2nd Lieutenant G. D. Guyer, 16th Infantry.
20. Means of Communication of an Army in the Field,
2nd Lieutenant W. M. Morrow, 21st Infantry.
21. Regular vs. Volunteer,
2nd Lieutenant T. F. Schley, 23rd Infantry.
22. Proportion of U. S. Cavalry in Time of Peace,
2nd Lieutenant Frank Tompkins, 7th Cavalry.
23. Wounded Officers,
2nd Lieutenant P. E. Marquart, 2nd Infantry.
24. How shall we Recruit our Army in Time of War?
2nd Lieutenant H. J. Price, 24th Infantry.
25. Fire Discipline,
2nd Lieutenant W. M. Crofton, 1st Infantry.

26. The Instruction and Training of Volunteers,
2nd Lieutenant J. F. Madden, 5th Infantry.
27. Cavalry Raids,
2nd Lieutenant P. Clayton, Jr., 5th Cavalry.
28. Cavalry Raids,
2nd Lieutenant J. H. Reeves, 4th Cavalry.
29. Remarks on Mexico and her Resources,
2nd Lieutenant G. W. Kirkpatrick, 8th Cavalry.
30. The Bicycle from a Military Standpoint,
2nd Lieutenant G. McD. Weeks, 15th Infantry.
31. The Bicycle for Military Purposes,
2nd Lieutenant R. W. Mearns, 20th Infantry.
32. The Battle of Perryville, Ky.,
2nd Lieutenant O. R. Wolfe, 22nd Infantry.
33. Practice vs. Theory in Military Education,
2nd Lieutenant J. F. Stephens, 10th Infantry.

Many of the above papers are of a high order of merit and show a great deal of labor and research in their preparation. The following deserve special notice:

“The Saber and Revolver,” by 1st Lieutenant W. H. Smith, 10th Cavalry;

“Regular vs. Volunteer,” by 2nd Lieutenant T. F. Schley, 23rd Infantry;

“The Influence of Modern Small-Arms and Heavy Ordnance on the Art of War,” by 2nd Lieutenant G. H. B. Smith, 4th Infantry;

“The Railroads of the United States considered from a Military Standpoint,” by 2nd Lieutenant H. O. Williams, 11th Infantry.

The first two essays were deemed to be of practically equal merit, the first having a slight advantage in that it limited itself to a purely professional subject. They are both recommended for publication in the service journals.

FIELD EXERCISES.

This most important branch of military instruction occupied a large part of the time of one of the assistant instructors of the Department during the last two months of the school

year. Special attention was devoted to the development of the following features:

1. Repetition of exercises to be avoided in the same class, as far as practicable.
2. General and special ideas to be stated as clearly and briefly as possible, and printed in the usual form.
3. Additional information absolutely necessary for the proper evolution of the exercises, precautions to be taken, and requirements after the exercise in addition to those already contemplated by the "Rules for Field Exercises," to be embodied in special instructions.
4. Only one exercise to be held each day, thus avoiding waste of time while waiting for another exercise to begin.
5. The respective commanders to be held responsible for the correct calculation of the distance from the company parade grounds to the initial point or rendezvous of the exercise, and the sounding of the calls so as to permit their commands to arrive at designated rendezvous on time,—thus avoiding unnecessary delays before and after leaving the garrison. An arrival too soon to be considered as much of an error as an arrival too late.
6. General and special ideas and instructions to be entirely confidential up to moment of arrival at rendezvous, when 10 minutes were to be allowed for explanation of plans, issuance of orders, etc.
7. The problems to be issued to the respective commanders at least three days before the exercise (in the class of exercises so far held) so as to enable them to study the ground, form plans, draw up orders, etc.
8. Avoidance of all suppositions with regard to the terrain, except in the case of bridges. The ground to be taken as found.
9. Thorough criticism of the solution of the problem and the movements of the various fractions of the com-

mands, on the morning after the exercise, with limited discussion by members of the class.

10. The production of a suitable map of the military reservation and vicinity. Printed copies of such map from an engraved plate are much superior to the best blue-prints for use at exercises and in rendering subsequent reports.

The troops of the garrison of Fort Leavenworth were employed in the exercises, all the positions of officers being filled by assignment from the student class according to roster.

The form in which the general and special ideas were printed and issued is shown in Field Exercise No. 1 ; but in the reports of the subsequent exercises these are consolidated to save space.

U. S. INFANTRY & CAVALRY SCHOOL,
DEPARTMENT OF MILITARY ART,
Field Exercise No. 1.

(A)

GENERAL IDEA.

A Blue force is advancing from Cameron , Mo., upon Topeka, Ks. The bridges of the Missouri river between Missouri and Kansas have been destroyed, with exception of the bridge at Fort Leavenworth ; the passage at Kansas City is strongly guarded.

A *Brown* force is marching from Topeka, Ks., to oppose the invasion of the state; a small detachment of all arms (brown) is advancing on Fort Leavenworth by forced marches.

SPECIAL IDEA .

BLUE:

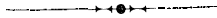
A *Blue* detachment was hurried forward to seize the bridge at Fort Leavenworth ; it completed its crossing at 2.30 p. m., at which time the main body reached Tracy. The detachment commander is ordered to take up a position and hold the bridge until the arrival of the main body, which is expected in two hours.

Composition of the detachment :

1st Battalion, 20th Infantry;

Troop B, 6th Cavalry ;

One platoon of light artillery (imaginary).



FIELD EXERCISE NO. 1.

(B)

GENERAL IDEA.

A *Blue* force is advancing from Cameron, Mo., upon Topeka, Ks. The bridges of the Missouri river between Missouri and Kansas have been destroyed, with exception of the bridge at Fort Leavenworth ; the passage at Kansas City is strongly guarded.

A *Brown* force is marching from Topeka, Ks. , to oppose the invasion of the state; a small detachment of all arms (brown) is advancing on Fort Leavenworth by forced marches.

SPECIAL IDEA .

BROWN:

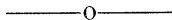
A Brown detachment composed of

2d Battalion 20 th In fan try,

Troops C and F, 6th Cavalry,

One light battery (imaginary),

arrived at the railroad cuts at 2.30 p. m. The commander has orders to destroy the bridge at Fort Leavenworth and re-join the main body. At the above moment he receives word that a Blue detachment has just crossed, and that a large force is two hours in rear.



INSTRUCTIONS TO BLUE COMMANDER.

1. The troops of the garrison detailed for your detachment will have orders to hold themselves in readiness after 1 p. m. , at which time a mounted trumpeter will report to you. After sending warning to the 1st Sergeants of the units concerned, you will cause the necessary calls to be sounded and move out

your command so as to arrive with the head of your column at the Rock Island Bridge at 2.30 p. m. (post time). You are cautioned against wasting the time and energy of your troops. Notify your officers of the hour (approximately) for the start, and take every precaution to avoid misunderstanding and delay.

2. At 2:30 p. m., you will give the necessary verbal orders to your commanders; five minutes are allowed for this purpose. Copy of these orders will be sent to the Instructor, Department of Military Art, at least 24 hours before the exercise ; your subsequent orders will be stated in the report; messages sent in by your cavalry commander will accompany your report, which will be handed in by 10 a. m. next day.

3. These communications are strictly confidential up to 2.30 p. m. of the day of the exercise, and will not be communicated to your subordinates before that hour.

In the other exercises these instructions are not stated as they are to a great extent repetitions, with different circumstances as to time and place.

This exercise was held April 5, 1897.

Extract from Report of Assistant Instructor in charge :

* * * *

1st Lieutenant J. C. Gregg, 18th Infantry, was detailed to command the Blue force, and 2nd Lieutenant V. A. Caldwell, 25th Infantry, the Brown.

The troops of the command detailed for the exercises were ordered to hold themselves in readiness in proper uniform after 1 p. m. of the day designated, subject to the orders of the commanders assigned. The initial moment of time for the beginning of the exercise was 2.30 p. m.; the Blue commander was ordered to have his force at the Rock Island Bridge, and the Brown commander at the railroad cuts at that time, and the commanders were held responsible for the proper sounding of the calls, formation and march of the troops, and arrival at the initial point at the designated<

moment. The object of this was to avoid unnecessary delays and standing of troops in ranks waiting for the exercise to begin.

The course of the exercise was about as follows :—

BROWN-

Left garrison at about 1.18 p. m. Arrived at initial point at 2.26-p. m. Officers were assembled and orders briefly and clearly given. The scouts advanced over the crest at the railroad cuts at 2.37 p. m. The Brown infantry advanced in three bodies : (a) *The right*, Company F, 20th Infantry (Lieutenant Price), with 2 guns, along Corral Creek to turn South Merritt Hill ; finding this was occupied they continued east and seized the high ground about 300 yards southwest of the bridge over One Mile Creek (Rabbit Point) ; (b) *The center*, Company H, 20th Infantry (Lieutenant Stephens), advanced on South Merritt Hill, then took a position in rear of Lieutenant Price in support ; (c) *The left*, one platoon, Company E, 20th Infantry, (Lieutenant Morrow), advanced north of Merritt's Lake and **eventually** approached the center.

The reserve followed the center and the platoon of artillery was placed in position on Rabbit Point.

The cavalry detached 12 troopers under Lieutenant Reeves to accompany the infantry ; the remainder of the two troops, with four guns of the battery, under Lieutenant Stotsenburg, proceeded under cover through the woods of the hill range south of the Atchison Pike, and through Leavenworth to a position south of the Reservoir. There the battery took up a position with the Rock Island Bridge in plain view at a distance of 2,500 yards; they were ordered to destroy the long trestle at the east end of the bridge, and then to attack the piers of the bridge itself. These latter movements were made without molestation from the enemy, in fact, they were not even observed.

The Brown force made several minor attacks against Blue infantry in the One Mile Creek ravine and forced out the Blue detachment therein. An advance was also made

along the river bank, but this was repulsed with serious loss. A platoon of cavalry also advanced to the bridge across One Mile Creek. The led horses were left in an exposed position and the reinforcement was of no consequence. **No impression** was made on the Blue position by the Brown infantry.

BLUE.

The command started at 2.18 p. m., and arrived at the Rock Island Bridge at 2.30 p. m. "Officers' Call" was then sounded and **the orders** of the commander were given clearly and concisely. The troops started for their positions at once.

The troop separated into detachments to find the enemy; one company took position north and the other south of the Rock Island track, on the high ground near the river west of the Rock Island Bridge, and two companies were in reserve under perfect cover on the street car track. The position taken was practically impregnable against an infantry attack, unless made by greatly superior numbers, but no attempt was made to hold ground south of the position which might be occupied by the enemy's artillery. The Blue artillery (2 guns) was placed on Arsenal Hill; its field of fire was quite limited, as the country to the south is so heavily wooded that the trees, even without foliage, obstructed the view.

COMMENTS.

The criticism to be made of the conduct of the Blue side is that they limited themselves to a purely passive defense, and failed to occupy ground from which the Brown artillery could destroy the bridge. It is true that the problem was a difficult one for Blue with the force available, yet the best use possible was not made of the opportunities offered.

The decision was given to Brown because of the 2 guns in position on Rabbit Point for 30 minutes without being disturbed by Blue infantry, being sheltered at the same time from the Blue artillery.

When the problem was devised it was thought that Reservoir Hill was too distant for effective artillery fire against the Rock Island Bridge within the time limit. As the distance

is only 2,500 yards, and the battery, moreover, would be aided in its fire by being able to range over water, this supposition probably was erroneous. The problem accordingly should be modified by an increase in the defender's force to cover this objection. Some small inconsistencies in exposure of troops were observed and criticized next morning, when the problem was under discussion with sketch of the ground and general and special ideas on the blackboard. The various phases of the course of operations and the possibilities of the problem were fully elucidated in the criticism of the umpire and subsequent discussion.

Attention was invited to the fact that a *Brown* orderly with imperfect knowledge of English delivered a much distorted message conveying an entirely erroneous order. The necessity of sending important messages in writing was emphasized thereby.

'FIELD EXERCISE NO. 2.

GENERAL IDEA.

The advance guard of a *Blue* force (operating from the north) has reached Fort Leavenworth ; *Brown* patrols have been observed in North Leavenworth.

SPECIAL IDEAS.

BLUE:

The Blue force will camp for the night near Fort Leavenworth. A detachment composed of 2d Battalion 20th Infantry, Troop K, 6th Cavalry, is charged with the security of the section between the road west of Target Range and the line Beddow's house-west end of Merritt's Lake.

BROWN:

A detachment consisting of Troop C, 6th Cavalry, Troop F, 6th Cavalry, will harass the enemy's outposts and endeavor to intercept his patrols, capture prisoners, and ascertain the location of his forces.

This exercise was held on April 16-17, 1897. Instructions to Blue commander required outpost to be in position at 4 p. m. , three relief+ to be posted before sunset, and night positions to be taken up at the proper time ; the **Brown** commander was required to make at least three demonstrations—with one troop before midnight, with the other after midnight, and with both at dawn.

Extract from the report of the Assistant Instructor in charge:

* * * *

The Blue force was commanded by 2nd Lieutenant T. F. Schley, 23rd Infantry ; the Brown by 1st Lieutenant C. J. Stevens, 9th Cavalry. Other student officers were assigned as captains and lieutenants of companies.

The movements and dispositions of the troops were approximately as follows :

BLUE.

The command left the garrison at 3.10 p. m., after the general and special ideas had been explained to the assembled officers. The cavalry was sent out in advance and a company of infantry formed advance guard. The troops halted near their position at 3.35 p. m.; at four o'clock the outpost was established. Inspection of the outpost was made between 4 and 5 o'clock, p. m. , but it was only cursory, a more minute inspection being reserved for a later hour. * * * Three reliefs were posted before sunset, and before dark the sentinels and pickets were pushed forward into lower ground. An attack was made by the enemy against the center near midnight ; a cossack post near the left was fired upon at close range at the same time. After midnight the detached post of cavalry was cut off.

BROWN.

The Brown force left the post at 9 p. m., and halted near south end of Grant Avenue. A party was sent forward to reconnoiter. As the Beddow place was found unoccupied, the command moved west to a position just south of that place,

and dismounted. Lieutenant Reeves with Troop F (dismounted) moved north and attacked the enemy and returned about midnight. Lieutenant Anderson with Troop C (dismounted) moved north of Government Lane and advanced against a detached post of the enemy situated in the railroad cuts near southwest corner of the reservation, finally capturing or dispersing all of the enemy's force stationed there (one troop). Lieutenant Anderson's force then moved northeast and surprised Lieutenant Morrow's force and drove it back. The led horses from Beddow's were then brought forward, but as they approached the railroad were fired upon by a squad of men of Troop K, 6th Cavalry, which had escaped capture. The horses were withdrawn rapidly and the squad was attacked by overwhelming numbers. It remained in the vicinity after withdrawing, and finally, at 2.20 a. m., the commander endeavored to cut his way through by charging up a road held by Brown dismounted men and blocked by led horses. This act was unnecessary as escape could have been effected in other ways; it would have been rash under any circumstances, and under the Rules for Field Exercises was impossible.

"Recall" and "Officers' Call" was sounded at about 2.20 a. m. , thus terminating the exercise.

COMMENTS.

Assuming the main body encamped near Fort Leavenworth, the line leading to the center of the section to be guarded would run about southwest. The line of observation of the outpost ought to have been approximately perpendicular to this line. In the disposition as made the line of observation was placed practically parallel to the Kansas Central Railroad track, thus unduly throwing forward the right flank and leading to exposure of that flank or to undue increase of space for the adjoining section. A more suitable line of observation would have been found on the crest of the ridge running a little south of east from the target houses (Long Ridge). It was also observed that Cossack posts were placed on the

slope toward the enemy, where, even if the men lay down temporarily behind the reed shelter improvised, their position would have been betrayed as soon as they stood up or moved about. The cavalry was placed in an exposed position, and, disobeying instructions to retire, was cut off. A better place for the cavalry would have been with the reserve. Patrols could have been sent out thence on the roads, and an examining post near the 1,000 yards firing stand would have guarded both roads; and the infantry picket could have then moved further east, thus economizing sentinels. One of the larger infantry companies would then have furnished sufficient sentinels and their relief for the line of observation; two smaller companies could have been placed in support, and one company and the cavalry not on duty would have furnished a suitable reserve.

Inspection of the sentinels showed that they were not properly instructed. Some did not know the numbers of their posts and pickets, nor the names of their commanders; the direction of the roads and the names of localities were known to but few. Two sentinels were found at 9.30 p. m. behind a railroad embankment 15 feet high, where it was impossible to observe any of the terrain in front. All this was, of course, due to neglect on the part of officers responsible for the instruction of the men. The common error of having too many men on duty as sentinels was made in this case also. The night was quite clear, with a full moon; a small number of observers could have given warning of any movements of the enemy.

The distance of the line of resistance from the camp of the main body (2,500 yards) was about the proper one. The ravines of the terrain afforded excellent opportunity for concealed fires for the reserve. Dead wood ought to have been gathered and better provision have been made for the comfort of the men, as the night was rather cool.

More frequent exercises of this nature will be required if all officers and men are to become familiar with their duties..

FIELD EXERCISE NO. 3,

GENERAL IDEA.

A *Brown* force is operating against Plattsburg, Mo.; Leavenworth is an important point on the line of communications. Armed partisans from Salt Creek Valley have caused frequent interference with railroads and wagon trains.

SPECIAL IDEAS.

BLUE:

A force of about 40 partisans from Salt Creek Valley is scattered in the forest northwest of Fort Leavenworth with agreement to rendezvous at the Stone Quarry at about 3.40 p. m.

Troops :-Company F, 20th Infantry.

Start : From Prison Cemetery, at 2 p. m.

BROWN:

In order to stop annoyance of the line of communications, the Brown commander has decided to search the forest northwest of Fort Leavenworth, bounded on the east by the western line of the Prison Reserve, on the north and west by Sheridan's Drive, and on the south by the Quarry road.

Troops :-1st Battalion, 20th Infantry,
Troop B, 6th Cavalry.
Start : 2 p. 111.

This exercise was held April 7, 1897. According to instructions issued, any partisans not found before the sounding of the recall at 3.30 p. m. were to be permitted to proceed to rendezvous without molestation.

Extract from the report of the Assistant Instructor in charge :

* * * *

The Brown force was commanded by 2nd Lieutenant P. A. Wolf, 3rd Infantry, and the Blue company by 2nd Lieutenant W. M. Morrow, 21st Infantry.

The Blue (Company F, 20th Infantry) left their parade ground at 1.25 p. m., and marched to the Prison Cemetery on

Sheridan's Drive, where the commander explained fully the object and details of the exercise. At 2 p. m. the force was divided into small parties and scattered in the woods south of Sheridan's Drive. The strength of the Hue force was 25 enlisted men and 4 officers. One squad of 5 men accompanied by Lieutenant Morrison, assistant umpire, got through to rendezvous a little after 3 p. m., and soon thereafter Lieutenants Morrow and Gregg with 6 more men joined them.

The Brown force operated as follows :

At 1.40 p. m. the officers were called together, the exercise explained and orders issued. The Brown troop of cavalry arrived at the Adjutant's office at 1.40 p. m.; as it had to wait there for 20 minutes a waste of time resulted. The command moved out at 2 p. m.; the troop went north along the eastern boundary of the designated territory and formed skirmish line in the space between Shady Creek and Sheridan's Drive, and advanced towards the west.

The infantry moved on the Quarry road. Two companies were dropped out near the old target range, and the other two searched the quarry and then proceeded north. At 2.40 p. m. the infantry formed a large arc near the western boundary of the reservation, extending from Sheridan's Drive on the north to the old target range on the south. At the signal "Forward", given at 2.40 p. m., this line advanced in an easterly direction, the idea being to crowd the partisans hiding in the woods in the direction of the Ice House. A very thorough search was made of the whole forest. After the recall the command was assembled at the Prison Cemetery with the exception of one company which stopped near the brick yard.

COMMENTS.

Some of the companies lost contact, but this was to be expected under the circumstances. The Brown plan was a fairly good one, though a simpler method could have been pursued in this case. In an undulating country marching

points of direction can be given which, if taken at a great distance, assist materially in preserving alignment and intervals in a general way. In a flat country covered with dense woods a compass would probably have to be used. When there are no landmarks in a wilderness, reading of the ground is the only recourse left. The escape of a large part of the Blues was due to the fact—as near as I can ascertain—that they advanced along the creek between the post and the old target range (Quarry Creek), thus passing behind the company which advanced from the old target range. At the sounding of “Recall” at 3.30 p. m., the Blues not discovered rose up and proceeded to rendezvous.

Lieutenant Wolf reported capture of one officer and 23 men; it is believed that several were reported more than once, and Lieutenant Morrison, assistant umpire, reports a squad of 5 going through without having seen any of the Browns.

No complaint was made of men refusing to surrender when halted or fired upon within the prescribed distance, and it seemed as if all the officers and men had a personal interest in making the exercise a success. Such work is exceedingly useful, for it shows the great difference between drilling on the turf and operating in close country, and affords an object lesson of the difficulties experienced by our troops in the Southern forests in 1861-65.

On the morning after the exercise the class was assembled in the Lecture Room. The general and special ideas were placed on the blackboard, as well as a sketch of the territory in which the troops operated. The movements were followed out in detail and the Instructor made some remarks as to methods to be adopted in difficult country under various conditions,

The Brown uniform in this case was given to the larger force in order to save the clothing of the men as much as possible. It is probable that with an exchange of uniforms a still larger force of partisans would have escaped.

FIELD EXERCISE NO. 4.

GENERAL IDEA .

A *Blue* force has been defeated at Winchester and is retreating across the Missouri River. All the permanent bridges have been destroyed but there is a good pontoon bridge at the mouth of Corral Creek.

A *Brown* force is conducting a vigorous pursuit in the hope of cutting off the retreat of part, of the enemy's force.

SPECIAL IDEAS .

. BLUE:

The rear guard of the Blue force is composed of

1st Battalion 20th Infantry, Troop B, 6th Cavalry ; the infantry of the rear guard arrives at the Beddow house at 2.30 p. m. At this hour a train of 400 wagons parked in the vicinity of the bridge commences crossing, and the troop of cavalry holding the Atchison Pike summit is forced to retreat before the infantry of the enemy's advance guard coming from Salt Creek Valley.

The rear guard will endeavor to hold back the enemy a sufficient length of time to effect crossing of the trains and to provide for its own passage.

BROWN:

The Brown advance guard arrives at the point where the Atchison Pike crosses the rail road tracks at 2.30 p. m. The commander has orders to press the enemy vigorously, to cut off his rear guard, and to intercept the large train he is endeavoring to take across the Missouri River,

Troops :

2d Battalion, 20th Infantry,

Troops C, F, and K, 6th Cavalry,

- O - - - - -

This exercise was held April 14, 1897. Extract from report of the Assistant Instructor in charge:

* * * * *

The Blues were commanded by 2nd Lieutenant G. H. B.

Smith, 4th Infantry, and the **Browns** by 1st Lieutenant J. T. Kerr, 17th Infantry.

Reports of the respective commanders, and of assistant umpires, and personal observation, show the course of the operations to have been about as follows :—

BROWN.

Left the garrison at 1.35 p. m.; arrived at designated rendezvous at about 2.15 p. m.; infantry advance guard proceeded east on Atchison Pike at 2.30 p. m. After gaining the summit, a platoon of cavalry was sent forward to look for the enemy. The remainder of the cavalry ($2\frac{1}{2}$ troops) proceeded *via* road north of railroad cuts, past the cemetery and south of Merritt's Lake to Grant Avenue; thence to Pope Ridge. It then formed for dismounted action against Rabbit Point, which commanded the supposed pontoon bridge. This attack proved unsuccessful, owing to arrival of a company of Blue infantry about half a minute before its culmination. The cavalry scouts having reported the open country clear of the enemy, the Brown infantry advanced across the pasture, moving in an easterly direction after leaving the Atchison Pike, and marching on the high ground south of Merritt's Lake. This advance was unopposed; the movement was made in proper formation. When this force crossed Grant Avenue it struck the Blue company holding the crest in flank, forcing it to retire. All the Brown infantry arrived on the crest at about 3.20 p. m., and, in conjunction with Brown cavalry, engaged the small force of two Blue companies in the vicinity. At 3.30 p. m., the final recall was sounded.

The decision was decidedly in favor of the Brown force.

BLUE.

Left the garrison at 1.17 p. m., which was a little too early. After passing the target-houses, rear-guard formation was taken up. At 2.30 p. m., the rear guard arrived at the Beddow house. One company was sent to Reservoir Hill, two to a central position under cover, near where the street-car

track crosses Corral Creek, and one company to the high ground north of said creek and east of Grant Avenue (Pope Hill). The cavalry retired from the Atchison Pike summit at 2.30 p. m.; upon arrival at Grant Avenue, by Government Lane, one platoon went to Reservoir Hill and the other hastened to occupy the high ground just mentioned. In the course of the action one company of infantry from the reserve was sent to reinforce the right.

The class was assembled as usual in the Lecture Room next morning, and, after description of the movements, etc., the following criticisms were made:

COMMENTS.

Brown:—While waiting for the exercise to begin, the cavalry remained mounted—a period of 20 minutes.

They did not take the shortest route, as ordered by the Brown commander; they did not make for the proper ridge, but took one 300 yards to the north, after crossing Grant Avenue, which, also, was contrary to instructions,

The squadron remained halted and exposed to fire at 300 yards range, until cautioned by the umpire. The time thus lost would have been more than ample to enable the three troops of Brown cavalry to solve the problem before the arrival of their infantry. A squad of Brown cavalry under a noncommissioned officer was observed halted in an exposed position for 15 minutes,—range 300 yards.

Blue.—Started too early. At the target houses a number of men were seen to fall out to go after water. It is not commendable to let men straggle after water, on a cool day, within 20 minutes after leaving the garrison.

After arrival at Grant Avenue, instead of sending a company down the broad road to hasten to occupy commanding ground north of Corral Creek, it was taken across country, down a hill, through fences, and up-hill again, barely arriving in time.

The Blue cavalry, after leaving the Atchison Pike summit, did not move with sufficient celerity.

The service of information was so poorly performed that the Blue commander received no word about the march of the Brown infantry, though it was in open country for a mile. Consequently, it was impossible for him to take proper measures to meet the Brown main attack.

The exercise was a very instructive one, and just before its culmination was full of interesting situations requiring repeated decisions.

FIELD EXERCISE NO. 5.

GENERAL IDEA.

A Blue army, deficient in cavalry, is operating towards the south along the west bank of the Missouri River, and has reached Kansas City; it depends on the Missouri Pacific R. R. for its supplies. Raiding forces of Brown cavalry and guerillas make it necessary that the railroad be strongly guarded.

SPECIAL IDEAS.

BLUE:

The commander of the 20th Regiment of Infantry is ordered to protect the Missouri Pacific railroad tracks on the military reservation of Fort Leavenworth. The section between the Prison brickyard and the Rock Island bridge has been fortified and will be held by the 3rd battalion of the regiment.

Start: 1 p. m.

BROWN:

A raiding force composed of the 1st Squadron, 6th Cavalry, and some guides, is ordered to destroy the Missouri Pacific railroad tracks, trestles, etc., on the Fort Leavenworth military reservation. The section between the Prison brickyard and the Rock Island bridge is known to be secure against attack.

Rendezvous:

On Sheridan's Drive near Rock Quarry, at 1.20 p. m.

This exercise was held April 15, 1897. Extract from report of the Assistant Instructor in charge :-

‡ * * * *

The Blue force was commanded by 1st Lieutenant J. R. Lindsay, 8th Infantry ; the Brown force by 1st Lieutenant J. M. Stotsenburg, 6th Cavalry. Officers of the student class were assigned as captains and lieutenants.

The movements of the troops were about as follows :—

BLUE.

The two battalions were formed at 1 p. m. The First Battalion (1st Lieut. W. N. Hughes, 13th Infantry, Commanding), marched to its positions near the railroad track north of the Prison brickyard ; the Second Battalion (2nd Lieut. H. J. Price, 24th infantry, Commanding), marched to and occupied positions south of the Rock Island Bridge.

The position of the *companies and numerous lookouts, patrols, etc., made this portion of the line secure against the small parties of Brown sent against it. As the approaches to the railroad tracks were under water to a considerable extent, no attack in force was to be expected on this portion of this line; moreover, in the daytime, no large body of troops could come within a mile of the section without being discovered. The operations were unimportant and unsuccessful, and this section may therefore be dismissed from further consideration.

BROWN.

The Brown raiding force assembled on Sheridan's Drive, near the Rock Quarry, at about 1.20 p. m. The officers were called together and the problem was explained to them. Several officers' patrols were sent out against the railroad, with orders to return by 2.30 p. m. Good points of observation were occupied and the Squadron was placed under cover. As most of the patrols had come in at 2.30 p. m., the Squadron was moved toward the north, keeping in the woods below Sheridan's Drive.

The command finally was halted and dismounted to fight on foot in the northeastern portion of the reservation, near the western boundary and about 200 yards north of the Millwood Road, save one troop which moved rapidly around North Hill to the vicinity of the railroad track and then dismounted to fight on foot. The flanking troop moved along the track, under cover most of the way. Two other troops arriving at the crest overlooking the railroad tracks, did some firing, and descended the hill. The flanking troop and the two coming down the hill then made a rush at the Blue position. At the Recall, which was sounded when the troopers arrived at the foot of the slope, 20% of the Brown force was ruled out as lost in the frontal attack ; a Blue squad of eight men was cut off and a further loss of three men was adjudged from the effect of fire. When the exercises were resumed another Blue company came up in a favorable direction and opened a flanking fire on the Browns.

COMMENTS.

Lieutenant Walke's statement that eight skillful men in one hour can disable one mile of track, was taken as a basis to estimate damage done.

The plan of the Blue commander was fairly good. However, for the 2,700 yards of track near hilly and wooded country, more troops would be necessary than for the 2,300 yards of open country south of the Rock Island Bridge, and it would seem that a more suitable division would have been, for instance, 5 companies in the northern section and 3 in the southern. It must be admitted, however, that at night the southern station would deserve the greater amount of protection because of the larger number of trestles.

A reference to the map will show that the position of Company G was not well chosen. Its fire in the direction of the track would have been a limited one. As the backwater of the slough almost touched the feet of the men lying behind the track, the company was exposed to the risk of being cut off. As it turned out, it only escaped because of errors made

by the Browns. The turning movement of the troop around the hill was an error, in my opinion, because if effective it could only result in driving the Blue company back on its reinforcements. The tactical error made by Browns was that when they had a plunging fire at 300 yards, making Blues position untenable, they did not wait for a decision of the umpire, but rushed in a frontal charge against the enemy behind a railroad embankment with a wire fence intervening. Although the general situation was greatly in favor of the Browns, this advance was extremely rash, and it was impossible to rule otherwise than a loss sufficient to put the organizations charging out of the fight for the day. One troop remained on the hill as a containing force to possible Blue reinforcements. It did not fire on Company G. The exercise was ordered to be resumed, with the view, in case enveloping movements were made, to rule Company G out of its position. While such movements were under way Lieutenant Gregg's company (B) came up and participated in the engagement, which was then terminated by the proper calls.

At the discussion of the problem and its solution before the class attention was invited to the respective plans and to errors in their execution. It was especially pointed out that the disaster of a direct frontal advance of the force coming down the hill could have been avoided either by remaining on the edge of the bluff until a decision by the umpire, or, by deviating a hundred yards to the south, thus turning Company G and cutting it off. This would have exposed nearly half a mile of track which could have been destroyed while the troops held back Blue reinforcements, of which one Company was distant 10 minutes, and others from 15 to 20 minutes. Under the actual circumstances the damage effected by Browns did not extend over more than 200 yards and could have been repaired in a few hours as there were no important trestles involved.

It was observed that the Blue battalion commander, being mounted, personally conveyed a message asking for

reinforcements, during the period between "Recall" and "Attention". Such a proceeding, of course, was entirely irregular, and was suitably commented on before the class. It made necessary the termination of the exercise before a complete solution had been attained.

FIELD EXERCISE NO. 6.

GENERAL IDEA,

A *Blue* force operating in northern Kansas has advanced to the Big Blue River. The main line of communication passes through Holton, Winchester, and Salt Creek Village, and crosses the Missouri River on a pontoon bridge $\frac{1}{2}$ mile north of Leavenworth; the railroads in northeastern Kansas and the permanent bridge, across the Missouri River have been destroyed. Raiding forces of *Brown* partisans are reported in the vicinity of Leavenworth.

SPECIAL IDEAS.

BLUE:

A detachment consisting of 1st Battalion and Companies A and H, 20th Infantry, Troop C, 6th Cavalry, is ordered to escort a train of 60 wagons from North Leavenworth to Winchester.

Start: From junction of Grant Avenue and Government Lane, at 2 p. m.

BROWN:

A raiding force consisting of Troops B, F, and K, 6th Cavalry, has orders to harass the enemy's line of communications, and to attack and endeavor to destroy convoys that may be discovered. The commander has information that a supply train of about 90 wagons crossed the Missouri River at 1.30 p. m., and that it will probably advance by Government Lane and Atchison Pike.

Rendezvous: At southeast corner of Fort Leavenworth reservation, at 2 p. m.

This exercise was held May 7, 1897. Special instructions in this case indicated method of outlining the wagon train and of parking it at termination of the exercise. **EXTRACT** from report rendered :

* * * * *

The Blue force was commanded by 1st Lieutenant Willis Uline, 12th Infantry ; the Brown force' by 1st Lieutenant W. H. Smith, 10th Cavalry. Officers of the student class were assigned as captains, lieutenants, and staff officers.

The movements of the two commands were approximately as follows :

BLUE.

The commander sounded the necessary calls and marched his command by Grant Avenue, arriving at rendezvous at 1.50 p. m. Seven escort wagons with 2nd Lieut. P. E. Marquart, 2nd Infantry, in charge, were already in position on Grant Avenue, at its intersection with Government Lane. An order directing the cavalry to move out at once was stopped at 1.54 p. m., because the problem contemplated start at 2 p. m. At the proper time the advance cavalry moved out at a rapid gait, followed by the advance guard. The first wagon of the train, preceded by a company of infantry, was started when 'the proper distance had been gained. The other wagons followed when the preceding wagon had advanced 306 yards. The train of 90 wagons, in six sections of 15 each, was thus outlined, the first wagon representing the head and the last the rear of the column. The main body of infantry moved opposite the middle of the train ; the rear guard, one company, followed it at a distance of about 600 yards.

A detachment of cavalry was assigned to the wagon train, and other troopers were detailed as messengers between the different fractions of the escort.

When the advance cavalry arrived at the foot of the hills, patrols were sent out in various directions to explore the country ; several of these were cut off by the enemy. Frequent reports were sent to the commanders of the advance

guard and of the main body, showing presence of a considerable force of the enemy in the hill country along the Atchison Pike. The infantry of the advance guard accordingly was moved forward, the wagon train went in to park about 300 yards from the foot of the hills on Government Lane, and two companies of the main body advanced to the assistance of troops engaged in front. At 2.50 p. m., Lieutenant Tompkins and party were captured and the engagement of two companies of infantry against, one dismounted troop ended in the clearing of the road at the summit. The wagon train was ordered to advance. It started off all right, the first three wagons taking the proper distances from park, but when a fire was brought to bear on the park, through some misunderstanding the remaining wagons started at a trot without distances; representation of the 50 or 60 wagons remaining in park was thus lost. A Brown force of two troops attacked from the flank, but superior numbers were soon brought to bear against them.

BROWN.

The Brown force left the post at 1.04 p. m. and marching by Cemetery, Target Range, Atchison Pike, and through the woods, arrived at rendezvous at 1.43 p. m. After explanation of the plans to the assembled officers, one troop, under Lieutenant Stotsenburg, was sent to Atchison Pike summit, to stop the progress of the Blue command, the other two troops were held secreted in the woods waiting for a good opportunity to attack the train. The parties sent out by Lieutenant Stotsenburg were pushed back by superior numbers of Blue infantry, and he finally was driven out of his position near the summit. A little after 3 p. m. the remaining two troops made an attack on the enemy's wagon train, but were repulsed.

COMMENTS.

Exploration by the Blue cavalry was rather limited, owing principally to the superior numbers opposed to them. The part of the troops not employed in detachments remained

in an exposed position at the intersection of Government Lane and Atchison Pike ; cover could have been found in the vicinity. By taking a position on the edge of the woods, approach of the enemy through the woods could also have been more readily detected, and capture of part of the force avoided. Near the summit an enveloping attack was brought to bear on the Brown dismounted cavalry by two companies of infantry. Although the former were in a favorable location they were greatly outnumbered and turned besides, and their position was rendered untenable.

The Brown commander did not make his main attack until he had seen the Blue infantry of the main body passing up the Atchison Pike. Fortunately for the latter they halted awaiting a message from the commander of their advance guard that the road was clear. As this officer delayed sending a report until he was reminded of the propriety of so doing, the Blue commander by accident had a force at hand for decisive action.

The plan of the Brown commander to draw a heavy force into an attack on the summit and then to make a dash at the train was excellent and was worked out satisfactorily.

The numerous wire fences at this portion of the reservation rendered mounted action out of the question.

The manner in which the enlisted men entered into the spirit of the exercise and the alacrity with which they complied with the rules concerning captures were observed with general satisfaction.

FIELD EXERCISE NO. 7.

PRACTICE MARCH FOR INFANTRY.

The companies of the 20th Infantry will leave the garrison and march over the following routes, sketches of which will be provided.

COMPANY A: S. W. on road west of target range ; W. on Barnes road; N. on Hund Station road; E. on Zimmerman road; S. E. on Pemberton road; return to post by road east of target range.

COMPANY B : s. W. on road east of target range; N. W. on Pemberton road; W. on Zimmerman road ; S. on Hund Station road ; E. on Barnes road ; return to post by road west of target range.

COMPANY C: Past prison brickyard; N. along railroad; W. 5 miles on Millwood road; S. to Atchison Pike; return to post.

COMPANY D: W. to Salt Creek village ; W. to Kennedy's; N. to Millwood road; E. to Mo. Pacific R R. ; return to post.

COMPANY E : Past prison brickyard; W. on Millwood road 3 miles; N. to Kickapoo; W. 1 mile; S. $1\frac{1}{2}$ miles; E. 1 mile; S. to The Frenchman's; return to post.

COMPANY F: W. to The Frenchman's; N. to Millwood road; W. 1 mile; N. $1\frac{1}{2}$ miles; E. through Kickapoo; 8. to Millwood road; E. to railroad; return to post.

COMPANY G : S. W. on road east of target range ; N. W. on Pemberton road; W. on Zimmerman road ; N. to Atchison Pike; return to post.

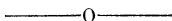
COMPANY H: TV. to The Frenchman's; W. on Atchison Pike $1\frac{1}{2}$ miles; E. on Zimmerman road; S. E. on Pemberton road; return to post.

Company commanders will designate the hour for the start, notify officers and 1st Sergeants, and move out at the appointed time, which should be selected with a view to return at 2 p. m.

The march will be conducted as prescribed in Infantry Drill Regulations under subject of "Marches". The company commander will report his return to Assistant Instructor at the Adjutant's office. A report in writing will be submitted showing time of starting, time of passing several cross-roads (to be marked on the map), time of meeting other troops, character of road and its condition, inaccuracies in the maps furnished, and other information which may be of

use for future field exercises, such as unfenced camping places near water, difficult stretches of road for wagons, weak bridges, etc.

The telegraph office at Post Headquarters has the official time.



This exercise was held May 13, 1897. Extract from report rendered:

* * * * *

The names of commanders, time of departure and time of return, are indicated below:

<i>Com- panies</i>	<i>COMMANDERS.</i>	<i>Departure A. M.</i>	<i>Return P. M.</i>
A	Lieu t. Mearns, 20th Infantry,	8.33	2.01
B	Lieut. Gregg, 18th Infantry,	8.36	2.00
C	Lieu t. Taylor, 23rd Infantry:	8.39	2.01
D	Lieut. Webster, 20th Infantry,	8.44	2.02
E	Lieut. Williams, 11th Infantry,	8.27	2.00
F	Lieut. Crofton, 1st Infantry,	8.19	1.45
G	Lieut. Weeks, 15th Infantry,	8.50	1.43
H	Lieut. Guyer, 16th Infantry,	9.04	2.02

The execution of this exercise was quite satisfactory. In two cases the companies arrived ahead of time. A good deal of allowance, however, must be made on account of the inaccuracies of the maps available, a defect which, it is hoped, can be remedied before similar exercises will be required from the next class.

FIELD EXERCISE NO. 8.

PRACTICE MARCH FOR CAVALRY.

The 1st Squadron, 6th Cavalry, will march via Atchison Pike to Kennedy's; from this point the separate troops will march over the routes designated below, maps of which will be provided.

TROOP B:

W. and N. W. to Lowemont; N. 1 mile; E. half a mile; N. half a mile; E. 1 mile; S. 1 mile; E. $2\frac{1}{2}$ miles; S. $1\frac{1}{2}$ miles; to The Frenchman's.

TROOP c:

N. $1\frac{1}{2}$ miles; W. half a mile; N. 1 mile; E. 2 miles; S. half a mile; through Kickapoo to The Frenchman's.

TROOP F:

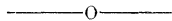
W. and N. W. to Lowemont ; S. $1\frac{1}{2}$ miles; E. $1\frac{1}{2}$ miles; S. E. $\frac{3}{4}$ mile; E. $1\frac{1}{2}$ miles; N. half a mile; E. $1\frac{1}{2}$ miles to The Frenchman's.

TROOP K:

W. $2\frac{1}{2}$ miles; S. 29 miles; E. to Salt Creek; N. to Atchison Pike; E. to The Frenchman's.

The Squadron Commander will designate the hour for the start, notify his officers and 1st Sergeants, and sound the necessary calls. Upon arrival at the initial point (Kennedy's) the command will rest for 30 minutes, and the Squadron Commander will designate the hour for the rendezvous at The Frenchman's. Each troop commander will calculate the time required to cover the route assigned him and fix his start so as to arrive at rendezvous at the appointed time. The Squadron Commander will then march the reassembled squadron so as to return to riding hall at 3.00 p. m.

The march will be made in accordance with paragraph 982, Cavalry Drill Regulations, modified as circumstances may demand. The official time is that of the telegraph office at Post Headquarters. Troop Commanders will submit reports showing time of starting from initial point, the time of passing several important cross-roads (to be marked by them on map), time of meeting or passing other troops, time of arrival at rendezvous, the character of the road and its condition, as well as other matters which may be of use for future field exercises, such as unfenced camping places near water, difficult stretches of road for wagons, weak bridges, etc.



This exercise was held May 13th, 1897. Extract from report rendered:

* * * *

The Squadron started from Riding Hall at 9.13 a. m.,

and arrived at Kennedy's at 10. 30 a. m. Pursuant to verbal instructions of the Squadron Commander the troops left Kennedy's, marched over the routes assigned, and arrived at new rendezvous as follows:

<i>Troop</i>	<i>COMMANDER.</i>	<i>Departure</i> <i>A. M.</i>	<i>Arrival</i> <i>P. M.</i>	<i>Distances.</i> <i>Miles.</i>
B	Lieutenant Anderson,	11.05	2.04	12.6
C	Lieu tenant Tompkins,	11.00	2.05	9.35
F	Lieu tenant Kirkpatrick,	12.00	2.04	9.75
K	Lieutenant Clayton,	11.08	1.56	11.6

The time assigned for rendezvous at The Frenchman's was 2.05 p. m.

The marching was satisfactory, except in the case of Troop C, which took 3 hours to march 9 miles, certainly not a compliance with the requirements of Drill Regulations, although some allowance must be made on account of the rolling nature of the country.

The march of the Squadron was commendable; it returned to Riding Hall at 2.57 p. m.

FIELD EXERCISE NO. 9.

GENERAL IDEA.

A *Blue* force was defeated by superior numbers near Lansing and is retreating through Leavenworth with intention of recrossing the Missouri river on pontoon bridges at Kickapoo Island; the permanent bridges have been destroyed.

A *Brown* force is conducting a vigorous pursuit.

SPECIAL IDEAS.

BLUE:

A detachment consisting of 1st Battalion, 20th Infantry, Troops B, C, & F, 6th Cavalry, is ordered to protect the western flank of the retreating force-about to enter Grant Avenue.

Rendezvous : Corner of Dakota and 20th Streets, 2.20 p. m.

Beginning of Exercise : 2.30 p. m.

BROWN:

The pursuing force has sent a detachment consisting of 2nd Battalion, 20th Infantry, Troop K, 6th Cavalry, by The Frenchman's to cut in on the flank of the retreating enemy.

Rendezvous: Atchison Pike summit, 2.20 p. m.

Beginning of exercise, 2.30 p. m.

This exercise was held May 20th, 1897. Extract from report rendered :

* * * * *

The Blue force was commanded by 1st Lieutenant Edward Anderson, 7th Cavalry ; the Brown force by 2nd Lieutenant O. R. Wolfe, 22nd Infantry.

The following were the movements of the command as observed and reported :

BLUE.

The infantry battalion, under Captain Edgar Hubert, 8th Infantry, left the post at 12.50 p. m., and arrived at the designated rendezvous exactly on time. The cavalry squadron, under 2nd Lieutenant George P. White, 3rd Cavalry, left the post at 1.10 p. m., and arrived at rendezvous at 2.10 p. m., which was 10 minutes before the proper time. This was probably due to a misunderstanding.

Lieutenant Anderson then stated his problem to the assembled officers and gave the necessary orders. At 2.30 p. m. the movement began with an advance of the cavalry on the Atchison Pike and through the wooded country to the west thereof, on the reservation. The patrols, point, flankers, and advance guard moved at a trot; the bodies of cavalry in close order moved at a walk, taking the trot later. Upon arrival at Atchison Cross the point and advance party were only about 75 yards ahead of the advance troop, which halted about 50 yards from Atchison Cross and dismounted to fight on foot on the east side of the road. The other two troops followed a short distance in rear and prepared to dismount on the west side of the road. At this moment a Brown troop charged. As the Blue cavalry was helpless, one troop was ruled out as captured (with exception of a few men), and the other two were ordered 300 yards to the rear to rally. The two remaining troops then dismounted and formed skirmish line at right angles to the Atchison Pike and advanced towards Atchison Cross. They attacked the Brown troop, which had dismounted in the meantime, and gained some

advantage over it, forcing it to retire from its position on the road. Brown infantry now came into action and the two troops were forced to fall back, their left flank being turned. When the exercise was resumed, after recall and decision, Brown infantry continued to advance against left of Blue cavalry; but one company of Blue infantry now joined on to their left and three other companies overlapped the right of the Brown. The exercise was terminated at this point and the decision made that Browns, being outnumbered and outflanked, would have to fall back, and, moreover, would probably have been cut off from their line of retreat by Atchison Pike summit.

BROWN.

The force left the post at 1 p. m.; it arrived at rendezvous at 2.10 p. m. The plan evolved by the Brown commander seems to have been to find a good position on or near the target range. The cavalry started at 2.30 p. m. and the infantry with advance guard moved southeast on the Atchison Pike.

First Stage.—The Brown troop arrived at Atchison Cross and its commander, perceiving the Blue commander in the act of dismounting, charged. He arrived within the charging limits before a single shot was fired and was rewarded by the surrender of a Blue troop as prisoners and the defeat of the other two troops.

Second Stage.—The Brown troop dismounted to meet the Blue dismounted cavalry, part of the troop being in the woods and part in the open at Atchison Cross. When the recall was sounded a number of Brown exposed men were ruled out and the remainder ordered under cover.

Third Stage.—When hostilities were resumed Brown infantry joined on to the right of the cavalry and turned the left flank of the Blue force in action, forcing it to fall back.

Fourth Stage.—Brown infantry in flank and front, and Brown cavalry in front, continued to advance against the two troops of Blue cavalry which were gradually forced back. Blue infantry now came up and when it entered into action the exercise terminated,

COMMENTS.

The plan of the Blue commander contemplated an enveloping movement and endeavor to cut off any force of the enemy that might be encountered. As the exercise developed this idea was carried out. When the Blue cavalry arrived at rendezvous the squadron formed line and then dismounted. This action blocked the road. On narrow roads it is much more convenient to dismount in column of fours and time is saved thereby also.

The movements of the Blue cavalry were too slow. Advance-guard formation was taken at a trot, whereas the Drill Regulations prescribe a gallop. In this case, where the commander desired to seize a favorable piece of ground, a rapid gait certainly was indicated. When the squadron commander later on sounded "Trot", his closed troops caught up on the advance parties, and thus it came about that when the enemy was encountered the point was only 75 yards ahead.

When the troops then tried to dismount they were caught in the act and defeated before they were able to fire a shot. The subsequent action of the Blue cavalry, however, was judicious ; falling back slowly before superior numbers, they gained time for their infantry to come up and go into action in a favorable direction.

The Brown commander seems to have had an erroneous plan. It was an error for him to leave the good position at Atchison Pike summit before gaining information as to strength and locality of the enemy. But when the enemy was found he changed his plans quickly and came into action in good style. As he had a company still in reserve he was in good condition to make a stubborn fight and could have effected his retreat to the north and regained Salt Creek Valley.

The general and special ideas, the course of the movements, and the final stage of action were explained and illustrated in the lecture room before the assembled class. In addition to the foregoing criticism and remarks, other features

contributing to the comfort of men and horses in hot weather were pointed out.

REMARKS ON THE FOREGOING COURSE OF INSTRUCTION.

In order to facilitate instruction in the Department the following publications were compiled and printed in pamphlet form :

1. 'Strategical Operations' "; by Major A. L. Wagner, A. A. G., and other officers of the Dpartment ;
2. "Marches and Supply"; reprint from Home's 'Précis of Modern Tactics';
3. "Pronouncing Vocabulary of about 1,000 names found in "Strategical Operations"; by Lieutenant J. T. Dickman, 3rd Cavalry;
4. 'Synopsis of 'Conduct of War' "; by Lieu tenant J. T. Dickman, 3rd Cavalry ;
5. "Questions on 'Conduct of War' "; by Lieutenant J. T. Dickman, 3rd Cavalry, and Lieutenant A. L. Mills, 1st Cavalry.

The text-books in use in the Department for the study of tactics are en tirely satisfactory and will, without alteration, serve their purpose for a number of years, at least until the next great war. Minor changes can be referred to in lectures on tactical subjects.

The elimination of recitations in "Security and Information", or their reduction to a sort of general review ; adjustment of recitations in other text-books so as to do away with or greatly reduce what is known as partial review ; and, finally, allotment of an increased share of time to the military department or departments, would result in the gain of the number of days necessary to amplify and systematize the course of practical instruction under the following heads :

1. A course in patrolling, both in the terrain and on the map.
2. Exercises with detachments of the size of a platoon, and company or troop.

3. Exercises in command of a battalion or squadron,
4. Combined maneuvers,
5. A course in tactical practice rides,
6. Map maneuvers, and war games or Kriegsspiel.

It is perhaps unnecessary to state that no amount of reading will make an instructor efficient in any of the lines named ; it is only by extended practice that he can acquire that readiness which contributes so largely to the success of such exercises.

It will be observed that at the very beginning of this practical course an elementary knowledge of Map Reading and Military Topography is required ; otherwise instruction will be much hampered. Information on the subject, to the extent contained in Captain Beach's book for noncommissioned officers, can be assimilated in a few days, and in rare cases it may be necessary to require preliminary study in that direction.

One of the most valuable features of field exercises is to be found in criticism and discussion next morning, while the events are still fresh in the minds of the participants. All the members of the class then for the first time see both sides of the problem, and the reasons for movements previously obscure to them can be made clear.

A large map, now in process of construction, will facilitate illustration of the disposition and movements of troops.

It is recommended that the numbers of lectures on Staff duties and the military systems of other countries be increased, and that the salient features of the more important lectures be included among the subjects for examination.

The writing of orders should be practiced to such an extent that members of the class will become sufficiently familiar with the subject to enable them to dictate a proper military order, on simple situations presented to them, after a few moments of deliberation,

This readiness could be acquired by daily side board exercises (as suggested by a member of the class, Lieutenant,

J. R. M. Taylor, 23rd Infantry) on situations prepared by the Instructor, without interfering with the study of the subject in hand.

The number of combined exercises should be increased so that each member of the class will have an opportunity to command all the Blues or Browns at least once, This will require half as many exercises as there are members in the class.

In order that benefit may be derived from war-games, the amount of time allotted thereto will have to be greatly increased. This need not interfere with recitations, as the work can be carried on by details from the sections.

The lectures delivered by members of the class on the more important campaigns of Europe and the United States were, with one or two exceptions, quite satisfactory, and I recommend that this system be continued. A knowledge of the important strategical lessons to be derived from the campaigns should be required on examination. One indirect benefit is derived from the fact that half days assigned for field exercises can, in case of unfavorable weather, be utilized for lectures.

In their duties as umpires the officers of the department were assisted by 1st Lieutenant C. H. Muir, 2nd Infantry, and 1st Lieutenant T. H. Slavens, 4th Cavalry.

GENERAL RECOMMENDATIONS.

The recommendation of my predecessor in regard to Light Artillery to be stationed at this post, either permanently or temporarily, by a detachment from Fort Riley, is repeated. Light Artillery is now pushed so far to the front that there will be few preliminary engagements in which it does not play a prominent part.

The terrain of the military reservation of Fort Leavenworth and vicinity is extremely diversified and would afford unrivalled opportunities for exercises with troops were it not for wire fences. I would recommend that all such obstructions, except at the southern boundary of the reservation, along the railroads, and around the gardens, be removed, and that the number of chain gates in those remaining be increased.

The three railroads on the reservation with their enclosing wire fences, the transfer of a large part of the most suitable ground to the Department of Justice, and other features, greatly reduce the space available for field maneuvers. The increase in the number and variety of such exercises contemplated in the revision of the School regulations, and also in instructions from higher authority, indicate the desirability of obtaining use of the ground adjoining the western boundary of the reservation and extending as far as Salt Greek. It is believed that arrangements with this point in view could be made with little or no cost to the Government, especially during the season when there are no crops in the ground. In this latitude, the late fall, winter, and early spring, afford many days entirely suitable for field exercises.

NOTE:—The road from Atchison Cross, over Beddow Hill, to the south end of Grant Avenue, has been closed since the above exercises were held and does not appear on the map.

Very respectfully,

Your obedient servant,

J. T. DICKMAN,

1st Lieutenant, 3rd Cavalry,

Assistant Instructor

In Charge of Department.

1 inclosure,

Rules for Field Exercises in Minor Tactics,

AT THE

UNITED STATES INFANTRY AND CAVALRY SCHOOL,

1. The statement of the general idea is furnished to the umpires and to commanders of opposing forces.

2. Special instructions given to either commander are not communicated to his opponent, but are furnished to the umpires.

3. Umpires wear a white band on the right arm. Spectators are expected to wear one on the left arm.

4. The decision of an umpire must be prompt, irrevocable, and at once obeyed. No umpire should allow himself to be prejudiced for or against either side.

5. The opposing forces are designated as the Blue and the Brown. The Blue, including officers, wear the regulation uniform with forage caps, The Brown wear canvas fatigue coats and campaign hats, their officers wearing campaign hats.

6. Before leaving the parade grounds, rifles, carbines, pistols and cartridge belts will be inspected by the officers to see that no ball cartridges are taken.

7. Whenever the senior umpire judges it necessary to suspend movements he will cause a trumpeter to sound "Recall" This signal will at once be repeated by all trumpeters. All forces will cease firing, halt, and remain in their positions, until the signal "Attention" is given for resuming operations,

which signal is repeated by all trumpeters. The ‘Recall’, followed by ‘Officers Call’ will signify that the exercises are at an end,

8. The trumpet signals ‘Recall’ ‘Attention’ and ‘Officers’ Call’ will not be ordered by any other officer than the senior umpire. The signals ‘Cease Firing’ and ‘Halt’ may be ordered by any umpire and are applicable only to such portion of the line as he may direct.

9. The similitude of actual warfare will be maintained as far as possible. An unmeaning fire is forbidden.

10. Forces advancing under a fire which in actual battle would cause their annihilation will be ruled out of action by an umpire.

11. If forces be halted in close order under severe fire the umpire rules out of action such numbers as he deems proper.

12. Officers usually dismount at 600 yards from hostile fire unless they be cavalry officers engaged in mounted action.

13. Umpires place any officers out of action who remain mounted at a halt within 300 yards of hostile fire, or, if on foot, remain standing unsheltered within that distance.

14. The actual collision of opposing forces or individuals is a punishable offense in these exercises. When attack and defense have reached the stage just preceding the crisis, the senior umpire suspends all movements.

15. Civilians passing must not be stopped; therefore, neither party should question them about the other’s movements.

16. Private grounds off the reservation will not be entered without permission.

17. Blank cartridges must not be fired at less than 100 yards from the supposed enemy.

18. All officers see that the men do not fire without command, excepting when thrown on their own responsibility as a scout, sentinel, or member of a patrol; that they do not fire after the command ‘Cease Firing’; that they never fire while moving; that they always take careful aim with the elevation ordered.

19. Officer commanding organizations see that the number of rounds fired is limited to that which is sufficient to denote the position occupied or the object to be attained by fire.

20. Firing in the immediate vicinity of haystacks and buildings is forbidden.

21. Cavalry charges stop at 100 yards from the supposed enemy.

22. If a cavalry commander, intending to use fire action; allows a mounted opposing force to approach prepared for charging with adequate strength and within 200 yards of his position, before his own troops are formed for firing- dismounted, the advantage will be awarded to the mounted party unless the ground is manifestly unsuited to charging. If adequate dismounted fire is opened upon a mounted party within 500 yards, the advantage will be awarded to the dismounted party.

23. When the flank of a position is turned, unless a change of front with sufficient force is executed in time to meet it, the turned party must fall back to a new position. If the turning party throws an adequate fire upon the flank of its opponent in line, the umpire rules out of action as many men, or such forces, as he deems proper.

24. If a party interpose between an inferior party and the main body of the opposing force, without being subjected to a superior fire from the main body, the intercepted party must surrender. If the interposing party be caught between the simultaneous attack of the main body and the intercepted party, the interposing party must surrender.

25. A scout or member of a patrol fired upon within a range not over 150 yards and ordered to surrender by superior numbers must comply with the order at once. He must surrender if summoned within 100 yards by one opponent who has the drop on him. If fired upon at a distance greater than 150 yards he will escape unless an umpire rules otherwise. Enlisted men violating this rule will be followed and identified with a view to preferring charges under 62nd Art. of War.

26. A column fired upon by artillery at less than 1,800 yards must deploy. Umpires will allow an exception when the commander judges accurately that the ground affords shelter to the force.

27. Each commander will submit a report of operations at such time as may be designated. He will call upon his subordinates for such reports as he deems necessary to accompany his own.

28. An officer will be detailed to accompany each command as topographical officer. He will prepare a map of the field and submit it to be forwarded with the report of the commander. This applies also when detachments are necessary to a considerable distance from the main force.

29. Should an officer claim that the ruling of an umpire is erroneous he must give his reasons in writing.

30. The decision in regard to advantage obtained or lost in the operations as a whole, and remarks on the action of commanders, will be made after the reports have been received.

APPENDIX C.

UNITED STATES INFANTRY AND CAVALRY SCHOOL, DEPARTMENT OF ENGINEERING.

Fort Leavenworth, Kansas, June 30, 1897.

To
The Secretary,
U. S. Infantry and Cavalry School.

SIR:—

In compliance with paragraph 56 Regulations U. S. Infantry and Cavalry School, I have the honor to report as follows:

The time assigned by the staff to this department since my last annual report has been apportioned as follows:

Recita- tions.	Lectures	Fortification Problem & Drawing	Practical Work	Examination
		Half Days	Half Days	Half Days
60	14	21	73	8

Reference to this table shows that over 41 % of the time allotted to this department has been devoted to exercises in application .

PRACTICAL WORK DURING AUGUST 1896.

Practical work during the month of August, 1896, was carried on with very little interruption, it having been necessary to suspend work for only three days on account of rain

or excessive heat. The work consisted of (1) practice with range finders (of which we have eight different patterns), (2) signalling with flag, heliograph and signal lantern, (3) road and position sketching, (4) the use of gun cotton and dynamite in the making of demolitions and (5) drill with Field Telegraph Train including practice in transmitting messages by telegraph and telephone and the cutting in on and the taking of a message from a field line without interrupting work between the terminal stations.

COMMENTS RESPECTING THE MAKING OF DEMOLITIONS.

My only comments in the foregoing work is with reference to the handling of and making demolitions with high explosives. This was made part of the course in 1894 and, while but little time is devoted to it, I believe the lecture on the subject given by Captain Hammond and the subsequent experiments, eight in number, made by or in presence of the class, were of great value in showing what powerful explosives the nitro-compounds are and yet how safely they can be handled and used in making demolitions. Among other tests it was shown that dynamite could readily be detonated by a shot from a rifle while gun cotton of twice the explosive power could not. It was also shown that a six-foot piece could be cut from a steel rail by placing 20 ounces of gun cotton in two packages on opposite sides of it and exploding them simultaneously; the latter experiment, by which a railroad might be temporarily disabled, need not have occupied more than three minutes.

THE COURSE IN MILITARY FIELD ENGINEERING.

Theoretical work in field fortification and field engineering was completed in sixteen advance lessons and four lectures. The practical work in these subjects was, it is believed, of much interest and usefulness. It consisted in selecting the site for, in laying out and in superintending the construction of shelter trenches, in the making of loop-holes, pits and entanglements, in the construction of fascines, gabions and hurdles, in the handling, extending and relieving of working parties under arms and superintending them while at work.

The application of the problem of defilade to the terrain was gone into rather more extensively with this than with previous classes. A single example will suffice to make clear the method followed. After carefully explaining on the ground the successive steps to be followed in the solution of the general problem and then applying these rules to a special case, problems (of which the following is a specimen) were distributed and solved on the ground.

PROBLEM 1.

“Trace a field work for 300 men, defilading it in plan from “Ft. Sully”, “The Loop” and the high ground near the farm house”, When this was completed and range poles placed at the angles of the proposed work which best corresponded to the required conditions, a second problem would be proposed as follows :

PROBLEM 1 a.

“On completion of work contemplated in Problem 1, defilade the proposed work in section”.

When this was completed and approved after criticism and discussion as to the methods adopted and results obtained, a third problem would be proposed as follows :

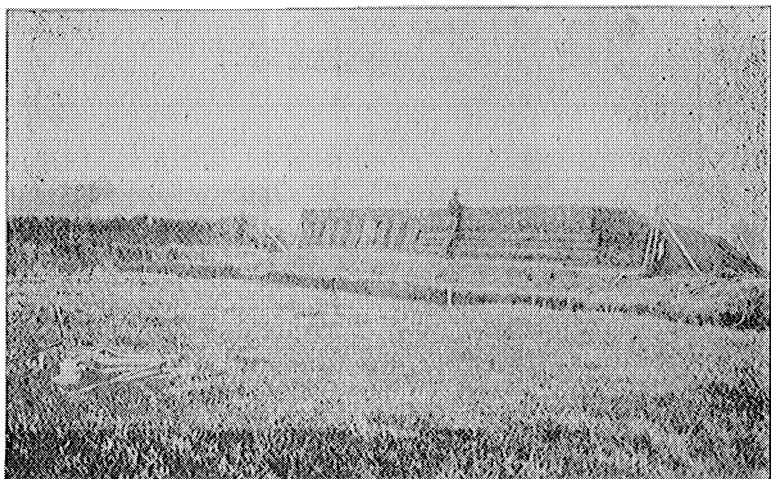
PROBLEM 1 b.

“On completion of work contemplated in Problem 1 a, determine width of ditch for the proposed work and stretch strings for the cutting lines (ditch and trench) for the first relief of working party”. This carried the problem to the point (if the field work were to be made) where profiles would be erected and the working parties would actually begin the excavations.

Three of these problems were in progress at the same time under the supervision of myself and my assistants.

As it is deemed inadvisable to spend much time in the making of gabions, hurdles and fascines for revetments it has resulted that successive classes each made but about 40 feet of parapet for a redan that is in course of construction. This work, a cut of which is here shown, has what we designate as

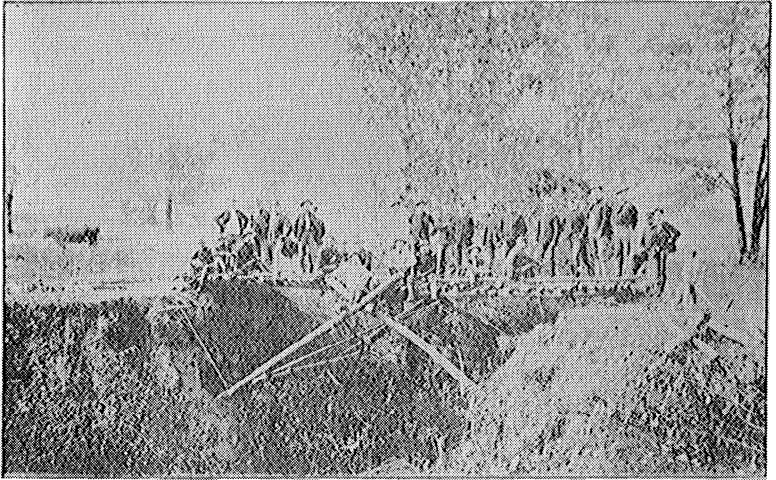
the normal profile ; it affords shelter against modern field artillery and gives 8 feet protection to the men standing in the trench. It was constructed in 10 hours.



An advance in spar bridge building was found to be practicable during October last with very satisfactory results. The same preliminary course was followed as heretofore in actually making the various lock and sling bridges and trestles on a scale one fourth actual size. This, while a useful preparatory step in familiarizing each with the details of construction, is actually misleading in respect to weights and other difficulties to be encountered in launching a full sized bridge.

Following the making of the small model bridges referred to, timber was cut and hauled to a deep muddy chasm varying

in width from 30 to 40 feet where the single lock bridge with corduroy roadway shown in cut was erected in one hour and a half.



It is believed that this class of work attains a most useful end since it is an unfortunate fact that many of our younger officers seem to be totally lacking in mechanical ability. It is certainly not too much to expect of any subaltern that he should be able to quickly and intelligently improvise a bridge or a raft from materials at hand, should the occasion call for it.

When the weather was too inclement for out door work, time was utilized in making the only piece of fortification drawing required during the course. This consisted in formulating complete plans for an earth work to fulfill 'certain specified conditions as to size of garrison, directions and heights of opposing hills etc. Each member of the class was given a different problem the solution and, construction of which occupied from ten to fifteen half days and involved all the principles brought out in the text and amplified in a subse-

quent lecture. Since it is recognized that there is no cut-t&-dried solution for these problems, they are freely discussed with the students and the methods to be followed in their solution pointed out, while each is left to use his own judgment as to the best manner of harmonizing diverse requirements,

THE COURSE IN BUILDING SUPERINTENDENCE.

With the idea of having more time for the practical part of the courses of Field Engineering and of Military Topography and of adding considerably to the present course it was recently suggested, in connection with a revision of the school regulations, that "Building Superintendence" be abolished. It is felt that there is so much strictly military ground to cover and so little time in which to do it that any subject, however useful in the abstract, that is not an essential part of a line officer's education should not constitute part of the school course. The only really essential portions, that is, those relating to drainage, sewerage and sanitary plumbing, as well as to drinking water will be fully covered in the course in Hygiene.

THE COURSE IN PHOTOGRAPHY.

With the instruments and the room recently made available, photography has become of very great importance to all departments of the school. During the past six months there have been printed from tracings and photographic negatives made by myself and my assistants no less than 2800 maps and drawings whose reproduction by any other means would have been impracticable by reason of the expense.

Our present enlarging apparatus however is defective in that we can only use artificial light, but with a change in the location of the room (plans for which will shortly be submitted) it can readily be made available for making map enlargements of a size such that they can be used for wall maps in discussing campaigns before the class.

COURSE IN MILITARY TOPOGRAPHY.

This course was begun and the theoretical part concluded previous to my last annual report but, as has been the custom heretofore, I have continued the practical part of the course, especially that relating to reconnaissance and out post sketching, and have added somewhat to it.

Members of the present class have each made nine road sketches with reports using the cavalry sketching case mounted. Beginning with short sketches of from 5 to 8 miles, the requirements have gradually been made more difficult up to the final piece of work which involved a ride of 25 miles 19 of which were included in the sketch. Instructions for this sketch were given at 8.30 a. m. and the completed map and report were turned in the same day at 5.45 p. m.; some few, of course, failed but the majority of the students turned in very creditable work, details of military importance such as streams, bridges, woods, railroads, towns, heights etc. were shown with considerable accuracy, so much so that the maps as submitted could have been used as reliable guides for the marching and camping of troops on the road in question.

The usual out post sketching on foot was done by the class during the absence of the cavalry squadron at Fort Riley last October.

Each member of the class made three of these sketches of country in front of an assumed out post line about a mile in length. This class of work is a modification of ordinary plane table methods and involves the contouring of a tract in front of an assumed line of observation without traversing in front of this line. As an aid in studying ground and in inculcating habits of observation I know of nothing more useful in the line of topographical work, unless it be road sketching.

During the progress of the course in road, position and out post sketching an opportunity was taken to criticise the work submitted with a view to the avoidance of methods

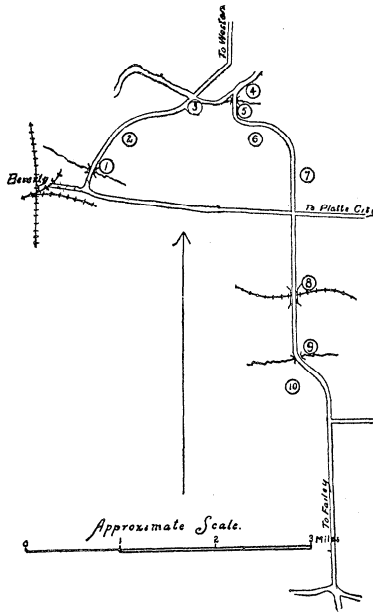
deemed to be faulty and with the further idea of showing the class certain pieces of work that were of marked excellence., As to errors in distances and directions these were made known to each student on the morning after the work was submitted but in a complete discussion of errors, omissions and faulty methods, recourse was had to the camera. Photographic copies were made of a number of the maps submitted and from these were made lantern slides which, with the assistance of a sciopticon, were shown on the screen in the lecture room.

The usual memorandum sketch made by riding quickly over a road and merely recording strides and roughly indicating directions and the various features on a long narrow strip of cross-section paper, and afterwards plotting the notes on returning to the post, resulted in a set of maps whose accuracy was all that could be desired for the purpose for which they were intended.

An exercise which was designated an ‘ ‘Observation Ride” was required for the first time of this class. It consisted of riding at the rate of 5 miles an hour over an unfamiliar road which by reason of fords, defiles, broken bridges etc., was selected as being particularly well fitted for the experiment. The scheme as briefly explained to the class at assembly (7.30 a. m.) was to make mental note of every thing of military importance that they observed after being warned that the work had begun. They were told that on returning to Sherman Hall they would be furnished with a set of questions on the particular route traversed, to which they would submit answers in writing. No notes except mental ones were to be made during the ride nor was attention to be called to anything.

After a ride of seventeen and one-half miles (eight of which were included in the problem) we reached the post on our return and assembled in the lecture room where a set of

questions was distributed, together with the rough outline map of the route traversed which is here shown.



The questions were as follows :

1. With respect to the bridge at (1) answer the following .
a--What, is its length. b-width, c-its height above bed of creek, d-its material? e—Would its removal seriously incommode a marching column? f—Would it be practicable to cross wagons by sloping the banks of the stream ?
2. What is the nature of the country in the vicinity of (2)?
3. Describe Bee Creek at (3). Would you judge the ford to be a practicable one during high water?
4. What is the nature of the ford at (4)?
5. Is there a crossing at (5) or in its immediate vicinity practicable for artillery and wagons ?

6. About what is the width of chasm at (5)? In case a bridge were desired at this point what variety would you suggest ?
7. What can you say of Bee Creek at (4) as to its passability for all arms ?
8. Did you notice any commanding point in the vicinity of (6)? What is the nature of the country for 300 or 400 yards to the N. E. of (6).
9. What is the nature of the road near (7)?
10. Describe the R. R. bridge at (8).
11. Would the loss of this bridge at (8) cause any material delay to an advancing army ? Why?
12. Indicate by form lines the slopes in the vicinity of (9) and (10).
13. Is there any prominent error in your blue print map between the Platte City-Beverly road and the southern terminus of today's problem ?

As to this exercise, which was the last but one of the two years' course, it was gratifying to note the extreme accuracy of nearly all of the answers. While some few officers were inaccurate, especially in regard to questions 11 and 12, nearly all showed that they remembered the various points of military importance and were able to give succinct and accurate answers to every question. The average of correct answers for the entire class was 93% and I believe this high standing on the first exercise of this kind over an unfamiliar road was due to a great extent to the persistency with which we have kept at the rapid mounted road sketching. It, more than almost anything else, inculcates a habit of observation which in certain individuals we find highly developed but in the majority of men seems almost lacking.

The last exercise of the course consisted in filling in an enlarged skeleton map of this section of the country. From the best maps available (county, Geological Survey and check maps made by ourselves) I had a skeleton road map on a scale of three inches to the mile constructed and from a tracing of

this were made several nigrasene copies which were mounted on heavy card board. This cardboard was then cut into pieces of convenient size which were distributed by lot to members of the class each of whom then filled in his own piece showing the various features, including contours. The pieces were then joined, the result being a topographical map showing a tract of about 80 square miles of country in the vicinity of this post. The entire work occupied less than two days and goes to show how rapidly a small scale civil map without contours may be converted into a military topographical map having considerable accuracy.

TEXT BOOKS.

The text book entitled "Military Topography and Etching" by Lieutenant E. A. Root, 19th Infantry, has recently been revised by myself and my assistants and will be used by the next class, it being the intention to supplement it by more and a greater variety of practical work than has been required of any previous class.

The first edition of the "Manual of Military Field Engineering" having been exhausted, will also be revised and will be reissued during the ensuing summer. Beyond the doing away with the text-book on Building Superintendence, heretofore referred to, I have no recommendations to make as to changes in the books used.

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Sherman Hall as remodelled answers the purposes of the school admirably except that there is as yet no provision made for ventilating the lecture and draughting rooms.

Very respectfully,

Wm. D. BEACH,

Captain, 3rd Cavalry,
Instructor.

APPENDIX D.

UNITED STATES INFANTRY AND CAVALRY SCHOOL,

DEPARTMENT OF LAW.

Fort Leavenworth, Kansas, June 20, 1897.

To The Secretary,

U. S. Infantry and Cavalry School.

SIR :—

In compliance with the requirements of paragraph 56, School Regulations, I have the honor to report as follows :

The portion of the course in Law pertaining to the last school year, comprised Military Law and consisted of the authorized text-book upon that subject (Winthrop's Abridgement), G. O. 100 of 1863, and the original and first five additional articles of the Geneva Convention as published in G. O. 3 of 1892.

The number of recitations were as follows :—

Advance. 20.

Partial Review. 10.

General Review. 5.

The recitations in general review were written and each was practically an examination over a prescribed part of the course. I consider the written recitations upon general review of great advantage to the student officer in teaching to crystallize his information into concisely written answers. One of the common faults of student officers, I have found to be a tendency to discursiveness and excursiveness in recitation. In

my department, I have endeavored to correct this tendency by constantly requiring answers to be as brief as is consistent with accuracy.

I do not recommend any change in the scope of the course or in the text-books used in my department.

The interest, attention and application of the student officers has been satisfactory and my assistants have displayed commendable zeal and energy.

The experience of the last year has confirmed me in the belief that the doing away with the system of marking the daily recitations and grading the student officers upon the results of the examinations has been beneficial ; but the examinations should be very full and complete and great care exercised in weighing and marking each answer.

I would respectfully invite attention to the fact that by reason of the absences of the librarian attending to his military duties, it has frequently happened that access to the library was impossible and much annoyance and delay thereby occasioned. The librarian is an exceptionally capable and valuable man in that position and it would be an advantage to the school, in my opinion, if he could be transferred to the general service, so that all of his time could be devoted to the library.

Very respectfully,

H. A. GREENE,

Captain, 20th Infantry,
Instructor.

APPENDIX E.

UNITED STATES INFANTRY AND CAVALRY SCHOOL, DEPARTMENT OF INFANTRY,

Fort Leavenworth, Kansas, June 22, 1897.

*To The Secretary,
U. S. Infantry and Cavalry School.*

SIR:—

I have the honor to make the following report of the work done in the Department of Infantry during the past year.

Recitations in "Infantry Fire" were commenced on the 2nd of November and continued until the 4th of December, 1896. A general review of the subjects occupied from the 14th to 21st of December, 1896, making

16 recitations in advance,
8 partial reviews,
and 6 general reviews.

The book should be rewritten and as the author has not seen fit to do so, I would respectfully recommend that if it is to be continued as a text-book that it be rewritten in the school. It has been corrected in my department to correspond with the results obtained from the experiments made with the new service rifle and carbine and considerable of the text not considered essential has been eliminated from the course.

The examination in "Infantry Fire" took place January 4, 1897.

Commencing February 1, 1897, the student officers were each required to perform a tour of Officer of the Guard and Officer of the Day, during which tours they were thoroughly examined as to their knowledge of their duties and the manner of performing the same.

By January 1, 1897, each student officer handed in an essay giving a scheme for the "Supply of Ammunition in the Field, to the U. S. Army". Some of these papers were of decided merit.

On June 9, 1897, the class was examined orally in "Small Arms Firing Regulations".

My assistants have shown very commendable zeal and interest in their duties as Instructors and have taken great pains in explaining to the student officers knotty points that were to some, not easy of comprehension.

Very respectfully,

Your obedient servant ,

J. T. HASKELL,

Lieut.-Colonel, 17th Infantry,
Instructor.

APPENDIX F.

UNITED STATES INFANTRY AND CAVALRY SCHOOL,
DEPARTMENT OF CAVALRY,

Fort Leavenworth, Kansas, June 11, 1897.

The Secretary,
U. S. Infantry and Cavalry School,
Fort Leavenworth, Kansas.

SIR:—

I have the honor to make the following report of' work done in the Department of Cavalry during the past year.

The course in Hippology was taken up in September.

The School Staff assigned forty-two half days for work in the course, five of which, in December, were devoted to a general review of the text—Horses, Saddles and Bridles, by Carter.

Lectures were delivered to the class as follows : --

By Veterinary Surgeon Hunter ;

Sept. 25, Bony framework of the horse.

Oct. 7, Muscles, ligaments and tendons.

Oct. 10, The foot.

Oct. 21, The teeth,

Oct. 28, Diseases.

Oct. 30, Diseases.

Nov. 4, The Digestive System.

Nov. 5, Diseases of the Digestive System.

Nov. 6, Soundness,

By Lieutenant Dickman, instructor.

Nov. 3, Description of the horse.

By Captain W. H. Carter, 6th Cavalry,

Nov. 9, Stereopticon lecture on Conformation.

Practical :-1 . Determination of age, 2. Examination for soundness.

Each student officer was given one preliminary and one record practice in each of the two subjects mentioned above,

For the record practice each officer was furnished an appropriate blank which he was required to fill out in due form, recording his opinions with respect to the age and soundness of the animal presented, by the instructor, for his examination.

The records made by the officers were subsequently duly compared with a test paper, or standard, established by the instructor himself, and the Veterinary Surgeon, by means of a personal examination of the horses presented to the class.

First Lieutenant J. T. Dickman, 3rd Cavalry, was in charge of the Department of Cavalry throughout the course in Hippology, assisted by 1st Lieutenant A. L. Mills, 1st Cavalry, Assistant Instructor of the Department.

Very respectfully,

ADNA R. CHAFFEE,

Major, 9th Cavalry,
Instructor.

APPENDIX G.

UNITED STATES INFANTRY AND CAVALRY SCHOOL,

DEPARTMENT OF MILITARY HYGIENE,

Fort Leavenworth, Kansas, June 22, 1897.

To The Secretary,

U. S. Infantry and Cavalry School.

SIR :-

I have the honor to respectfully submit the following report covering my actions as Instructor, Department of Military Hygiene in the U. S. Infantry and Cavalry School at this post, since my assignment as such by par. 2, School General Orders No. 11, dated November 6th, 1896.

Seven lectures were delivered by me on December 11th, 14th, 15th, 16th, 17th, 18th and 21st, as follows :

1. Definition of the term Military Hygiene ; importance of, and necessity for, the study ; selection of soldiers.

2. Military clothing ; materials,; principles of selection and construction.

3. Food and principles of cooking and preparing.

4. Habitations, including site for buildings ; character of soil ; floor space ; heating and ventilation.

5. Camps and Marches ; selection of site ; police ; soil contamination ; sanitary inspection of; sinks, personal cleanliness ; amusements, &c.

6. Sewage and waste ; disposal of, different methods ; house plumbing ; traps ; vent pipes ; sewers ; construction of, &c.

7. Water, considered in its sanitary aspect ; sources ; contamination and purification of; effects of impure drinking water, &c.; preventable diseases.

These lectures were, in general, merely expansions and explanations of the abstract notes of Colonel Woodhull, contained in his little book on "Military Hygiene". The class of studentofficers were required to carefully study this work and on Wednesday, January 6th, 1897, from 9 to 12, and from 1 to 5 o'clock, the entire class was subjected to a written examination on Military Hygiene as required by School General Orders No. 1, January 2nd, 1897, to fix the relative merit and standing of each student officer in the class.

The following is the list of questions submitted to the class in this written examination :

What do you understand by the term 'Military Hygiene'? Why is it important that all line officers should understand and be governed in their treatment of soldiers by the principles of this science ?

2. Give the principal physical and mental requirements which a recruit should possess to render him a fit subject for enlistment into the military service of the United States.

3. Describe the principal effects of drill **upon** recruits and mention the precautions to be observed in its proper conduct.

4. What is the chief and essential object of all clothing? Why should wool be preferred to cotton and linen as a material for ordinary military clothing and especially for undergarments ?

5. Mention the chief objections against india rubber clothing for constant permanent wear.

6. State the means by which chafed and blistered feet may be guarded against in men unaccustomed to marching.

7. Give a general classification of "Food". State what purpose each class accomplishes in the body,

8. Describe in detail the method which should be employed in making beef **soup** with vegetables.

9. Why is fresh beef to be preferred to salt meat as an article of diet for soldiers.

10. What produces Scurvy? And what means should be taken to cause its disappearance from a command ?

11. Describe the effect of Alcohol on the human system. Give the objections to its use.

X2. What do you understand by the term ‘Ground Water’? In what way may it effect the health of animals and men? State precautions to be observed regarding it,

13. What amount of floor space, according to your text-book, should be allowed soldiers in barracks? And why?

14. Why is ventilation of soldiers’ barracks necessary?

15. Describe the experiment, mentioned in your text-book, of the mouse confined in a jar and give the inductions to be drawn therefrom regarding the cause of its death.

16. Describe what you understand by “natural ventilation” of a building, and give the factors upon which it depends?

17. Describe the most generally convenient method, as stated in your text-book, for the winter ventilation of soldiers’ barracks.

18. What do you understand by the terms “Sewage and Sewerage”? And give the essentials to be observed in a system of house-plumbing, to prevent the introduction of sewer-air in to a dwelling.

19. Upon what does the “dry-earth” method for the removal of excreta depend for its efficacy? And how is it generally carried out in practice?

20. How may cistern water become contaminated, and unfit for drinking purposes?

21. What makes water polluted with sewerage dangerous for drinking purposes? By what different means can such damage be avoided?”

All the members of the student class were found proficient in this examination.

It gives me pleasure to state that all the members of the class paid close attention to the lectures and conducted themselves in an orderly and gentlemanly manner.

Very respectfully,

Your obedient servant,

HENRY McELDERRY,

Major and Surgeon, U. S. Army,

Instructor.