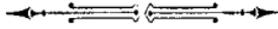


# ANNUAL REPORT FOR THE YEAR 1903.

(School Year 1902-1 903.)

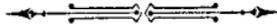


## GENERAL SERVICE

—AND—

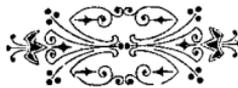
## STAFF COLLEGE

FORTLEAVENWORTH, KANSAS.



***COLONEL C. W. MINER.***

SIXTH U. S. INFANTRY,  
COMMANDANT.



1903.

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**GENERAL SERVICE AND STAFF COLLEGE:**

*Fort Leavenworth, Kansas,  
July 25, 1903.*

*The Adjutant General,*

*U. S. Army,*

*Washington, D. C.*

SIR:—

I have the honor to submit the following report of the operations of the General Service and Staff College for the school year commencing September 1st, 1902, and ending with the graduation of the class of 1903 on the 23rd instant.

The student class was originally composed of ninety-six members, as follows;

1st Lieut.	Percy W. Arnold, 1st Cavalry,	
1st "	James S. Butler, 1st Cavalry,	2
2nd "	C. Rodman Jones, 1st Cavalry,	2
1st "	Edgar N. Coffey, 2nd Cavalry,	
1st "	Consuelo A. Seoane, 3rd Cavalry,	
1st "	William R. Taylor, 3rd Cavalry,	
1st "	Robert R. Wallach, 3rd Cavalry,	
1st "	William A. Austin, 4th Cavalry,	
2nd "	John A. Degen, 4th Cavalry,	2
2nd "	Granville R. Fortescue, 4th Cavalry,	
1st "	Charles S. Haight, 4th Cavalry,	H
1st "	Thomas M. Knox, 4th Cavalry,	2
1st "	Ward B. Pershing, 4th Cavalry,	2
1st "	Joseph C. Righter Jr., 4th Cavalry,	
1st "	Jens E. Stedje, 4th Cavalry,	
1st "	John P. Hasson, 5th Cavalry,	
1st "	Frank T. McNarney, 6th Cavalry,	
1st "	Ewing E. Booth, 7th Cavalry,	H

1st Lieut. Solomon L. Jeffers, 7th Cavalry, ✓  
2nd " Albert E. Phillips, 8th Cavalry, 3 ✓  
2nd " Henry S. Terrell, 8th Cavalry, ✓  
1st " Rush S. Wells, 8th Cavalry, ✓  
1st " George Williams, 8th Cavalry,  
1st " John E. Hemphill, 10th Cavalry,  
1st " Basil N. Rittenhouse, 11th Cavalry, ✓  
2nd " James E. Abbott, 12th Cavalry, ✓  
1st " Herbert J. Brees, 12th Cavalry, ✓  
2nd " Arthur N. Pickel, 12th Cavalry, D  
2nd " Douglas H. Jacobs, 14th Cavalry,  
1st " Rudolph E. Smyser, 14th Cavalry,  
1st " Gordon Johnston, 15th Cavalry, H  
1st " Leonard T. Baker, 1st Infantry, ✓  
1st " William B. Folwell, 1st Infantry,  
1st " E. Alexis Jeunet, 1st Infantry H  
1st " DeWitt W. Chamberlin, 2nd Infantry,  
1st " Franklin S. Leisenring, 4th Infantry,  
2nd " John C. Murphy, 4th Infantry,  
2nd " Auswell E. Deitsch, 5th Infantry, ✓  
1st " George R. D. MacGregor, 5th Infantry, ✓  
2nd " Charles R. W. Morrison, 5th Infantry,  
1st " Albert S. Williams, 5th Infantry,  
1st " George N. Bomford, 6th Infantry,  
1st " John F. Wilkinson, 6th Infantry, D  
2nd " Joseph C. Wilson, 6th Infantry,  
1st " David A. Snyder, 6th Infantry, ✓  
1st " Percy M. Cochran, 7th Infantry,  
1st " Fred L. Davidson, 7th Infantry, ✓  
1st " Frederick W. Mills, Jr., 7th Infantry, ✓  
1st " William A. Cavanaugh, 8th Infantry,  
1st " Henry M. Fales, 8th Infantry, ✓  
1st " Walter H. Johnson, 8th Infantry, ✓  
1st " Alvin C. Voris, 8th Infantry, ✓  
1st " Benjamin P. Nicklin, 9th Infantry,  
1st " Kaolin L. Whitson, 9th Infantry,  
1st " Donald C. McClelland, 10th Infantry,  
Captain John B. Schoeffel, 10th Infantry,  
2nd Lieut. George R. Crawford, 11th Infantry, ✓  
1st " John T. Dunn, 11th Infantry, ✓  
1st " Rowland S. Pike, 11th Infantry,  
2nd " Morris M. Keck, 12th Infantry, ✓

1st Lieut.	Frank D. Wickham, 12th Infantry,
1st "	Charles F. Andrews, 13th Infantry,
1st "	Frank R. Curtis, 13th Infantry,
1st "	John M. Kelso, Jr., 13th Infantry, ✓
1st "	Allan L. Briggs, 14th Infantry,
1st "	Arthur M. Ferguson, 14th Infantry, ,
1st "	Bryan Conrad, 15th Infantry, .1
1st "	Thomas R. Harker, 15th Infantry,
2nd "	Harry D. Mitchell, 16th Infantry,
1st "	Charles H. Danforth, 17th Infantry,
1st "	Charles S. Prank, 17th Infantry, ✓
1st "	Solomon B. West, 18th Infantry,
1st "	William M. Goodale, 19th Infantry, ②
2nd "	John F. McCarthy, 19th Infantry, ✓
1st "	William B. Graham, 20th Infantry,
1st "	DeWitt C. Lyles, 20th Infantry, ✓
1st "	James M. Petty, 20th Infantry,
1st "	George M. Grimes, 20th Infantry,
1st "	William C. Fitzpatrick, 21st Infantry, ②
2nd "	William A. Haycraft, 22nd Infantry, ✓
1st "	Fred Bury, 23rd Infantry,
1st "	Robert E. Grinstead, 23rd Infantry,
1st "	Thomas B. Crockett, 24th Infantry, ✓
1st "	Fred W. Bugbee, 25th Infantry,
1st "	John W. French, 25th Infantry,
Captain	Patrick A. Connolly, 26th Infantry,
Captain,	Walter T. Bates, 27th Infantry, ②
1st Lieut.	George E. Kumpe, 28th Infantry,
Captain	Englebert G. Ovenshine, 28th Infantry,
1st Lieut.	William M. True, 28th Infantry, ✓
1st "	Gideon H. Williams, 28th Infantry,
2nd "	Joseph B. Caughey, 29th Infantry, ✓
2nd "	Franklin P. Jackson, 29th Infantry, ✓
1st "	Eugene P. Crowne, 29th Infantry,
1st "	Milo C. Corey, 30th Infantry,
1st "	Cromwell Stacey, 30th Infantry,

Of the foregoing class seventy-five members successfully passed the examinations and were graduated.

The following thirteen members continued the course to the end, but failed in two or more subjects and were not graduated:

- 1st Lieut. Edgar N. Coffey, 2nd Cavalry,
- 2nd " Douglas H. Jacobs, 14th Cavalry,
- 1st " Leonard T. Baker, 1st Infantry,
- 2nd " Auswell E. Deitsch, 5th Infantry,
- 2nd " Charles R. W. Morrison, 5th Infantry,
- 1st " Frederick W. Mills, Jr., 7th Infantry,
- 2nd " Morris M. Keck, 12th Infantry,
- 1st " John M. Kelso, Jr., 13th Infantry,
- 1st " Bryan Conrad, 15th Infantry,
- 2nd " William A. Haycraft, 22nd Infantry,
- 1st " Thomas B. Crockett, 24th Infantry,
- 1st " William M. True, 28th Infantry,
- 2nd " Franklin P. Jackson, 29th Infantry.

The following members were dropped from the class roll for various reasons, as follows :

- 2nd Lieut. C. Rodman Jones, 1st Cavalry,-discharged the service because of failure to pass second examination for promotion.
- 1st Lieut. George R. D. MacGregor, 5th Infantry,-resigned.
- 2nd Lieut. George R. Crawford, 11th Infantry,-discharged the service because of failure to pass second examination for promotion.
- 1st Lieut. John. T. Dunn, 11th Infantry,-undergoing treatment at hospital, Hot Springs, Arkansas.
- 1st Lieut. Charles S. Frank, 17th Infantry,-undergoing treatment at hospital, Washington, D. C.
- 2nd Lieut. John F. McCarthy, 19th Infantry,-dismissed the service by sentence general court -martial.
- 1st Lieut. DeWitt C. Lyles, 20th Infantry-undergoing treatment at hospital, Washington, D. C.
- 2nd Lieut. Joseph B. Caughey, 29th Infantry,-discharged the service because of failure to pass second examination for promotion.

In making this report, I cannot speak too highly of the cordial relations that have existed at all times between the members of the College Staff, and of the hearty support given me during the past year in our combined efforts to make the College a success. A word of commendation is also due to the Assistant Instructors who have conducted the section room work. They have worked indefatigably at all times, without regard to days or hours, and when it is taken into consideration that more ground has been covered during the

year than ever before in any one year during the history of the institution, when it is remembered that instructors and students alike were new to the work, that very many of the latter had barely a common school education, and that many students were from six weeks to three months late in reporting, it must be conceded that the work accomplished by the class and by those charged with the instruction is little short of remarkable.

During the year's work it was found necessary to court-martial three of the student officers for "neglect of duty" in connection with their College work, as they had become decidedly indifferent and negligent in attendance and recitations. The effect was salutary, and resulted in obtaining good work from the officers tried, for the remainder of the course, as well as a decided improvement in the work of several others who were rather indifferent during the first half of the course.

The following is a synopsis of the work in the different departments, the details of which will be found in the reports of the heads thereof, hereto appended,

#### **DEPARTMENT OF TACTICS.**

This Department was under the charge of Captain Joseph T. Dickman, 8th Cavalry, and the course as carried out has been eminently satisfactory to all concerned.

I cannot too highly commend the zeal and ability of Captain Dickman in filling what I consider one of the most difficult positions in the Army. The head of the Tactical Department of this College must needs be a man of energy, ability, and stamina; possessing a wide range of both book and practical knowledge, a man of research in military history, and above all, should possess the keen judgement to draw correct conclusions from the military experience of all countries. Captain Dickman has shown that he possesses all these, and it is to be regretted that duty takes him to other fields of work, (The General Staff).

The following were the Assistant Instructors in this Department:

Captain Louis C. Scherer, 4th Cavalry,  
Captain William H. Simons, 6th Infantry,  
Captain Lyman M. Welch, 6th Infantry,  
Captain. Robert J. Maxey, 24th Infantry.

### DEPARTMENT OF ENGINEERING.

This Department has been in charge of Captain Thomas H. Rees, Corps of Engineers, and has been conducted to my entire satisfaction.

Captain Rees has eliminated Photography from the course and has added other more practical work, until now the course in Engineering is considered, by those competent to judge, to be about all that could be desired considering the time allotted. When the course is again extended to two years, Captain Rees will, if retained, place the Department in a high degree of efficiency. He is pre-eminently the man for the place, and I strongly recommend that he be retained at the head of the Department as long as he may be willing to serve.

The following were the Assistant Instructors during the year.

Captain Edwin T. Cole, 6th Infantry,  
1st Lieut. George M. Hoffman, Corps of Engineers,  
1st Lieut. Gilbert A. Youngberg, Corps of Engineers,  
2nd Lieut. Wildurr Willing, Corps of Engineers.

Without detracting in the least from the abilities or work of any one of the above, it is but just to say that Captain Edwin T. Cole, 6th Infantry, has rendered most efficient service in the Department and is particularly well fitted for the work. He should be retained as senior assistant to Captain Rees, as he is thoroughly competent, both as to rank and ability, to take charge of the Department in case the Chief is called away or relieved.

### DEPARTMENT OF LAW.

The Department of Law has been under the charge of Major Henry M. Andrews, Artillery Corps, for the entire year, and the work has been thorough and satisfactory. The course has covered Military Law, International Law and Regulations; the time allotted was all that could be spared during the one-year's course, but is not sufficient. It is noted with satisfaction that Administration is eliminated from the course the coming year, which fact will add considerable time to law proper. No course at the College offers so much room for development as the Law Course as heretofore taught, principally along the lines of "Martial Law", and the "Law of War." It is hoped that the future will see an exhaustive course in the "Law of War" instituted, covering the subjects of "G. O. 100 of '63," "G. O. 52 of 1902," "Military Commissions," "Provost Courts," and "Concentrations."

The following were the Assistant Instructors in the Law Department:

Captain Omar Bundy, 6th Infantry,  
Captain Tyree R. Rivers, 4th Cavalry,  
Captain Dwight W. Ryther, 6th Infantry,  
1st Lieut. Arthur P. S. Hyde, Artillery Corps.

#### **DEPARTMENT OF MILITARY HYGIENE.**

This Department has been under the charge of Lieut-Colonel John Van R. Hoff, Deputy Surgeon General, Post Surgeon. Although the time allotted to this Department has been insufficient and the course much too limited, the instruction given by Colonel Hoff has been very satisfactory indeed. The student officers many times have expressed their interest in the lectures given, and in the knowledge gained therefrom.

This course, like the Law course, is a subject for much development in the way of an extensive series of lectures. The surgeon who has charge of the Department should have no other duties to perform, as it will tax a sturdy man's efforts to the utmost to do full justice to the course.

As is well stated in Colonel Hoff's report, hereunto appended, his College work has been but "an episode of his office as post Surgeon of the largest post in the Army, the duties pertaining to which fully occupy his time and demand his entire attention?"

I take this place to express my appreciation of the cordial assistance given me at all times by the Assistant Commandant of the College, Major Smith S. Leach, U. S. Engineers. He brought to the work a mind well stored with useful information, a keen knowledge of the wants of this institution, and excellent judgment in routine work, and I have found his suggestions and advice of inestimable value during a somewhat trying year. It is but fair to state that every officer on duty at the College, with the exception of Captain Dickman, did his college work in addition to his post duties, except where hours clashed, in which case college duties took precedence. I strongly recommend that post officers on duty at the College be relieved from all garrison duty, and that, so far as possible, the Instructors and Assistant Instructors be taken from other commands, abilities being equal.

#### **REMARKS AND RECOMMENDATIONS,**

Of those who failed to graduate, it is but proper and just to say that the majority of them did honest and faithful work

throughout the year, and so far as personal effort is concerned deserved their diplomas. But owing to lack of early education, to advancement in years beyond the age at which a man most easily assimilates technical knowledge, to lateness in reporting at the school and consequent inability to make up for lost time, (and in one case, the latter reason coupled with bereavements at home, the young officer having lost his father mother, and brother), and in general, to the system of marking, those who failed were unable to pass successfully all of the required examinations. It is believed by the majority of the Instructors and Assistant Instructors, as well as others connected with the College, who have given the subject much thought, that, under a different system, of marking, some deserving and efficient officers who failed would have been graduated; under a system that compels a man to stand or fall on his examinations alone, these men simply could not "cram" sufficiently to pass, though their work in the recitation-rooms throughout the year had been markedly better than many who graduated. There were several officers in the class who attracted attention in this respect. Two of them worked hard and faithfully from start to finish. They worked Saturdays, Sundays, holidays, evenings, and all the time. Their daily recitations were up to the average, and they apparently had a good knowledge of all subjects. Whatever they had to do, they did well, and stood well in the estimation of their instructors. But when it came to memorizing all of the book for examination, they simply could not do it, and failed to get their diplomas.

In another case, the man's daily recitation work was poor, His recitations were seldom, if ever, satisfactory to the instructor, though hardly poor enough to be called "unsatisfactory" in a technical sense and to be reported. In brief, his dsily work for the year was indifferent, yet when it came to examination he was able by "cramming" night and day, on general review and during the examination period, to pass successfully all of his examinations, and got his diploma.

For the above reasons, as well as because it is believed to be a fairer method, it is recommended that the system of marking be changed to one in which daily work shall count two-third and final examination one-third on graduation standing, and it is further recommended that if at the close of a school period any man has passed over ninety per cent in daily work that he shall not be required to pass examination. It is believed

that the above system will be conducive to excellence in daily work on the part of the students, and will be a more just one for all concerned.

It is recommended that the course of Instruction at the College be extended to a two-years course, commencing with the school year September 1, 1904, and that instead of ordering one hundred men here every two years and keeping all of them in one class, the number of men ordered to report here September 1, 1904 and each year thereafter, be reduced to fifty or thereabouts, so that the total number of officers under instruction at the College at any one time after September 1, 1905, shall be divided into two classes, one of which shall graduate each year. The reasons for this recommendation are as follows.

1. The fewer men in a class, the more attention can be given to each man individually.
2. The second class, namely, the one in its second year at the school, can give much assistance to the first class (the one in the first year's course) by answering numerous questions on the course, and by giving them many bits of information and advice which the experienced can always give the inexperienced, and can thus save instructors and assistant instructors many needless questions. The two smaller classes, one graduating each year, would need no more instructors than the one large class graduating every two years.
3. The best men in the second class would have sufficient experience and could be utilized as umpires in the patrolling and reconnaissance problems and various maneuvers of the first class.
4. A class of one hundred men is unwieldy and hard to handle, owing to the lack of room in the college building; the lecture-room and draughting-room are too small to accommodate so many men at once.
5. Last but not least, the work and turmoil of properly providing for one hundred incoming and outgoing officers and their families at the beginning and at the close of each school year would be reduced by one half.

It is recommended that upon graduation of a class, all proficient officers be ordered to report to such commanding general of Army field maneuvers, or Army and Navy maneuvers, for that year as the Secretary of War may direct, reporting at such time as the designated maneuvers shall commence,

and at the close of which they shall proceed to join their various regiments, unless granted regular leaves to take effect at the close of the maneuvers. This will be, it is believed, a most instructive and fitting termination to the course of study here and will give young officers a chance to see and work with large bodies of troops in the field, and thus obtain a practical knowledge of what they have been studying theoretically, besides furnishing a set of practically educated umpires for the maneuvers. The delay between date of graduation and date of reporting at the commencement of the maneuvers will be practically all the leave the most of the class will want, and will serve as a well-earned rest after two year's hard and confining work.

It is recommended that this post be furnished with fifty horses as mounts, exclusively for student officers, and that an enlisted detachment of fifty men, to be commanded by the Instructor in Equitation and Hippology, be detailed to care for these horses. Serious difficulty has always existed in furnishing mounts to the student class for field work, and this difficulty is now largely increased owing to the increased number of officers ordered here for instruction. The present system of allowing a student to call upon a troop commander for a horse and an orderly at will, always has been a nuisance, is productive of much ill feeling among the men, dissatisfaction among troop commanders, and is unsatisfactory to the students.

It is recommended that the post of Fort Leavenworth be made independent of the Department of the Missouri, and set apart as a separate independent department under the command of the Commandant of the General Service and Staff College. The reasons why the College should be independent of the Department Commander are self-evident and need no comment, and the post of Fort Leavenworth should also be independent of the Department Commander because the work required of the troops by both College and the Department is more than should be required of them, and is the cause of much dissatisfaction among both officers and enlisted men. It is a constant complaint of company, troop, and battery commanders that their men will not re-enlist for duty at this garrison owing to the excessive amount of work required of them.

Very respectfully,  
CHARLES W. MINER.  
Colonel 6th Infantry,  
Commandant,

APPENDIX A.  
**REPORT OF THE SECRETARY.**

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General Service and Staff College,  
 Fort Leavenworth, Kansas,  
 July 25th, 1903.

*Commandant,*  
*General Service and Staff College,*

SIR:—

I have the honor to submit the following report pertaining to my office and duties as Secretary of this College.

I assumed charge of the office June 1st, 1903, relieving Captain Lewis M. Koehler, 4th Cavalry, pursuant to S. O. 101, A. G. O., c. s.

The amount of money allotted to the school for the fiscal year 1903 was \$11,512, and became available December 10th, 1902. It has been expended as follows:

**DEPARTMENT OF ENGINEERING:**

Instruments and supplies, . . . . .	\$ 5,982.88
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**OFFICE OF THE SECRETARY:**

Furniture, . . . . .	\$1,987.10	
Books for Library, . . . . .	1,880 36	
Extra-duty pay of enlisted men, . . . . .	525.60	
Printing Office supplies, . . . . .	328.29	
Typewriters, . . . . .	208.85	
Photographic instruments and material	199.30	
Newspapers and Periodicals, . . . . .	175.95	
Mimeograph supplies, . . . . .	57.85	
Rent of telephones, . . . . .	24.00	
Incidentals, . . . . .	141.82	
	5,529.12	
	11,512.00	

These expenditures have been made in compliance with orders and regulations.

During the current school year eight hundred and thirty five volumes have been purchased and added to the library. Besides these forty-five volumes of reports and government books have been received from the several executive departments at Washington, thirty-one volumes (American and English Encyclopedia of Law) donated by the Judge-Advocate General's Department, and about one thousand volumes have just been received as a gift from Brigadier General Samuel B. Holabird, U. S. Army, retired. I am sorry to state that seventeen boxes of the latter, nearly 31 of them, were caught in the Kansas City flood, and are badly damaged; in fact most of them are completely ruined. I shall select such as are worth re-binding, and after having them cleaned and re-bound, place them in the Holabird alcove.

The Library is also indebted to General A. W. Greely, Chief Signal Officer U. S. Army, for numerous works received during the year, and to the Director of the Geological Survey and Superintendent of the Coast and Geodetic Survey for numerous books, maps, and charts of value furnished free of charge. The librarian, Mr. Cornelius Collins, is now at work, under my charge, cataloguing the library in the most modern and improved manner, and the printers are also at work setting up the forms for this catalogue; when completed it will make a volume of about six-hundred pages, which I hope to have ready for issue by the 1st of November. This will be a catalogue of size, appearance, and reference value which will be in keeping with the size and value of the College library, which, when properly arranged in the new fire-proof building for which plans are now under consideration, will be a credit to the College and to the service.

The school is already supplied with an excellent photographic outfit, and only such small amounts have been expended on it as was found necessary to place the various cameras and instruments in good working order, and prevent further injury from disuse and to purchase such small quantities of chemicals and materials as were necessary for school work.

It is recommended that the museum which now consists of a few old implements of war and curios, be placed in a suitable room in the new library building, and that efforts be made to obtain a collection of modern articles and implements of war, constantly kept up to date, to serve as object lessons for student officers in studying their profession. Samples

of small-arms of latest models, together with infantry and cavalry equipments of all modern nations, should constantly be kept on hand for the enlightenment of students. It is thought that this can be done through our military attaches and consuls abroad with but comparatively small expense to the College fund.

During the past year the method of keeping the records of the school has been changed from the old, antiquated book system to the modern card system, which it is my intention to amplify and impt ove in certain directions as observations may teach and necessity demand.

The college is fairly well supplied with furniture of suitable make and style, but a good many additions in the way of desks, tables, filing cases, paper files for the library, library tables, and library chairs, are still needed to properly equip Sherman Hall and the library. The College is growing, both in size and national importance, and it is deemed proper an4 necessary to place and keep the various offices and section rooms in a state of creditable appearance and to have them all properly supplied with office furniture, pictures, etc., so as to be presentable and attractive when inspected by military attaches, foreign officers, and other visitors from at home and abroad. The offices of the Commandant and Secretary and of the heads of all Departments have been recently decorated and placed in good condition. It is my attention, as soon as the new allotment becomes available, to purchase, on approval of the Commandant, such articles of furniture and rugs as these offices may need, and also to place the various section-rooms and the chief clerk's office in a more presentable condition.

It has been the custom for years to supply officers of the Army and of the National Guard with military text-books through this office. This necessitates a large amount of additional labor in the Secretary's office, but it is believed it is appreciated by those who benefit thereby and that this method of supplying books is of value to the service as well as a great convenience to the officers supplied; this custom has been continued during the past year, and, with the approval of the proper authorities, will be continued in the future.

There are four civil service men, viz., three clerks and one librarian, and six enlisted men employed in connection with the College.

The three civil-service clerks, Mr. J. W. Healey, **Mr. W. B. Lydenberg**, and Mr. E. N. Fesler, are all able and competent men and excellent clerks. They have worked indefatigably and without regard to hours, and are deserving of consideration. To Mr. Healey, chief clerk, especially, I am under great obligations for his untiring efforts to keep the College records and accounts in excellent shape. He is an old soldier, ex-volunteer officer, and War Department clerk, **and** thoroughly understands his work. I strongly recommend that another stenographer and typewriter be obtained for duty in the Secretary's office, as it is manifest that the present force cannot do the work of the coming year; if a civil-service man cannot be obtained, enlisted men will have to be detailed for the work. Enough work is brought into the Secretary's office from the Department of Tactics alone to keep one competent man busy throughout the school year. There should also be added to the civil-service list a janitor and a printer. These, supplemented with necessary help of enlisted men, would furnish a fair working force in the Secretary's office and around the College building.

Mr. Cornelius Collins, the College librarian, has rendered satisfactory service, and deserves credit for the excellent condition of the library.

Very respectfully,

**MILTON F. DAVIS,**

Captain 1st Cavalry,  
Secretary.

**APPENDIX B.**

**DEPARTMENT OF TACTICS.**

**FORT LEAVENWORTH, KANSAS.**

July 21, 1903.

**The Secretary,**

*General Service and Staff College,  
Fort Leavenworth, Kansas.*

**SIR :**

I have the honor to submit the following report on the work of my department during the school year 1902-1903.

**PERSONNEL OF THE DEPARTMENT.**

The following officers were assigned to duty in the Department of Tactics.

1. Captain Joseph T. Dickman, 8th Cavalry,
2. Captain L. C. Scherer, 4th Cavalry,
3. Captain W. H. Simons, 6th Infantry,
4. Captain L. M. Welch, 6th Infantry,
5. Captain R. J. Maxey, 24th Infantry.

Captain Simons was on leave of absence during the months of November and December, 1902; Captain S. J. B. Schindel, 6th Infantry, performed his duties during that period.

**ORGANIZATION OF THE CLASS.**

Of the ninety-six student officers ordered to the College, eleven were still absent on October 9th; on October 28th all had arrived except Second Lieutenant G. R. Crawford, 11th Infantry, who reported on December 8th, 1902.

The class was divided into eight sections of twelve members each. This arrangement was maintained throughout except for the purpose of recitations in drill regulations, the Cavalry officers in the latter case being divided into three

sections and the Infantry into five. For instruction in riding the class was divided into four platoons. One-fourth of the class was assigned to each of the troops, E, F, G, and H, 4th Cavalry, for the purpose of obtaining mounts when required for duty or exercise.

#### **ALLOTMENT OF TIME,**

The calendar from September 1st to December 21st, 1902, shows 79 days available for school purposes; of these 49 half days were allotted to the Department of Tactics.

The second term, from January 4th to June 30th, 1903, contained 127 working days; of these 105 half days were assigned to the Department of Tactics. Total for the year 154 half days.

#### **SUBJECTS STUDIED.**

This time was utilized in the study of the following subjects:

1. Security and Information.
2. Small Arms Firing Regulations.
3. Manual of Guard Duty.
4. Infantry Drill Regulations.
5. Cavalry Drill Regulations.
6. Organization and Tactics.
7. Hippology.

#### **LECTURES.**

Lectures were delivered on the following subjects, or furnished in printed form :

1. Modern changes in Fire Arms and their Tactical Effects.
2. Instruction in Patrolling.
3. Small Arms Ammunition Supply.
4. Patrol duty and Equipment Therefor.
5. Description of the Horse.
6. The Skeleton of the Horse.
7. Articulations, Ligaments and Tendons.
9. Soundness and Unsoundness.
10. The Horse's Foot.
11. Internal Organs of the Horse.
12. Sanitary Organization.
13. Charts and Tables of Organization of Troops.
14. Field Orders, Messages and Reports.
15. Discussion of Exercises in Patrolling .

16. Solution and Discussion of Field Exercise No 2.
17. Solution and Discussion of Field Exercise No 3.
18. Solution and Discussion of Field Exercise No 4.

#### **DEMONSTRATIONS IN FIELD ARTILLERY.**

The whole class was divided into sections and under direction of Major H. M. Andrews, Artillery Corps, the details and working of siege batteries, mountain batteries, and rapid-fire guns were explained by exhibition of the pieces and harness, and lectures on the details of construction and operation.

#### **PRACTICAL WORK.**

The practical work of the Department was classified as follows.

1. Infantry Drill Regulations. Practical examination in the School of the Soldier and in the School of the Company; Cards A and B.

2. Cavalry Drill Regulations. Practical examination in the School of the Soldier, School of the Trooper, and School of the Troop; cards A, B and C.

3. Manual of Guard Duty. Tours of duty as officer of the day, and as officer of the guard.

4. Security and Information. a. Patrolling on the map (14 exercises.) b. Patrolling in the field (3 exercises.)

6. Organization. Problems (2) in the organization of a division and a corps.

6. Writing of Orders. Daily practice for three weeks in writing orders on the blackboard,

7. Tactical exercises\ on the map. Three exercises (march of a command and outpost problem.)

8. Field exercises with troops. The 6th Regiment of Infantry, the 2nd Squadron, 4th Cavalry, the 28th Field Battery, and one section of an ambulance company, were placed at the disposal of the Instructor and utilized for field exercises, the command being officered throughout by student officers. Six exercises were held, and in connection with the three more important ones, the whole class was assembled on the morning following the exercise, and each student required to submit his solution in writing; then a discussion of the exercise as it actually developed was submitted by the Instructor together with criticism and indications as to correct solution.

9. Hippology. a. Exercises in determining the age of horses. b. Description of horses, c. Conformation. d. Soundness.

IO. Instruction in equitation. Under direction of Captain R. A. Brown, 4th Cavalry, 20 lessons in equitation were given to members of the class during November and December and March and April. The following extracts from memoranda submitted by Captain Brown are concurred in:

“Members of the class reporting for this duty included all grades of riders. Some officers had served as high as twelve years in the cavalry arm; others did not have even the most elementary knowledge of the subject. Between these extremes every possible degree of experience was represented?

“To begin with, all officers who had served an enlistment in the cavalry, or more than one year as an officer actually with their regiments, were excused from instruction. The remainder were then started on a modified recruit; course. At the end of eight lessons it was found that so many of the students were physically unequal to the demands of such a course, and so many were excused by medical officers for ailments disqualifying them for riding, that an entirely different course suggested itself during the interval of over two months between the two parts of the course.”

“Accordingly, the lessons in March were all with the saddle-about one-half with the watering bridle, and half with the curb bridle and wearing the saber. These lessons were given with the idea of preparing the officer to appear before troops, mounted, wearing saber and spur and prepared to take care of himself and his horse.”

“All the members of the class who attended instruction with a few exceptions learned to saddle and bridle their horses correctly. They also learned to mount and dismount properly, and they acquired a knowledge of the correct military seat. Many of the class made considerable progress in acquiring the seat at all gaits, but the lessons were too few to settle them into the seat as a matter of habit.”

“It is suggested that the lessons, whatever their number, be given in one continuous series. It requires three or four lessons to harden the men so that they do not suffer physically. Thus, fifteen lessons given continuously are more beneficial than twenty lessons divided into two series. A favorable time for such a course of riding lessons would be from the middle of February to the middle of April?

The importance of an elementary knowledge of equitation on the part of all officers is so great, and the exercise itself is so beneficial to young men, that a progressive course of about 30 lessons of one hour each, should be given to all student officers, the season extending from January to May.

11. Essays. In compliance with the College regulations each student officer prepared and submitted an essay on a professional subject. Publication of the best five in the Cavalry Journal is recommended, consent of the author being obtained for that purpose.

#### RECOMMENDATIONS.

It is of course desirable that the whole class be present on the opening day of the first term, so that all may start on the same footing. Another source of annoyance during the past year was the necessity of frequent examinations of student officers for promotion. The latter being of paramount importance, these officers were allowed some time for preparation, and thus practically two weeks were lost to them, perhaps at an important period of the course, and the Instructor's plans for the smooth working of his department were seriously disturbed.

Instructors.-Before the Spanish-American war the instructors and assistant instructors at the Infantry and Cavalry School were taken from the Army at large. This afforded the advantage of greater selection and did not deprive the garrison of Fort Leavenworth of a large part of its officers.

Since the war, the two-year's course of the school has been condensed into one, and the classes have been more than doubled in size. The necessity for having competent instructors, who can devote all of their time to their educational duties, is therefore more apparent than ever. The thoroughness of instruction, especially in the practical work, is necessarily impaired by the reduction in time available; an effort must be made to compensate for this by increased labor on the part of the instructor and his assistants.

Maps.-The maps of the Fort Leavenworth military reservation and the adjoining country are out of date, the one compiled by the undersigned and printed for use of his and other departments and for the garrison being now seven years old and the plate worn out. It has been considered an advantage by the map-making department in past years not to have a good map of the reservation, because it interferes

with the convenience of instruction in military topography. If this objection still be held valid, it is suggested that the country east of the Missouri river and that south of the city of Leavenworth can be utilized for practice in sketching, but is not likely ever to be needed for tactical exercises. At all events, a good topographical map of the reservation and the country as far west as Lowemont is a necessity for the practical exercises of the College and the post. Work on such a map should begin at once and a plate made on copper before the beginning of the next school year.

Fencing.—Some of the student officers organized a fencing class, with the instructor of the Kansas City Athletic Club as teacher. The attendance being voluntary only a moderate amount of benefit was derived.

In order to provide the young officers with beneficial and instructive exercise during the winter months classes in fencing and the use of the broadsword should be organized. Compulsory attendance would improve the set-up and activity of officers who have not had the advantage of systematic physical training.

Troops.—The practical work of the Department of Tactics involves the use of troops to a considerable extent. At a post which is subject to frequent inspection and continual observation, where there is a great deal of routine work and little if any credit is given for connection with the College, such additional work is liable to become irksome. Under these circumstances it was most gratifying to observe the marked interest of the enlisted men in the field exercises, which contributed very materially to the success of the work.

At Field Exercise No. 6 the total enlisted strength of the companies was as follows:

E.....	31	I.....	27
F.....	35	K.....	28
G.....	22	L.....	28
H.....	31	M.....	29
2nd Battalion	<u>119</u>	3rd Battalion	<u>112</u>

Similar deficiency appeared in Field Exercise No 1, and also in the cavalry in Field Exercise No. 5.

It is hardly necessary to point out the desirability of having organizations of greater strength than shown by the above figures.

Field Exercises.—The diversified terrain of the Fort Leavenworth reservation is admirably suited to the purposes of exercises in minor tactics. Although the reservation ap -

pears large on the map, it is considerably cut up by a number of obstacles, such as three railroad tracks, with double lines of wire fence, and an electric road. The new prison reservation also interposes wire fences without gates, and there is prospect of more of them. The area available for actual use of troops is therefore limited; for mounted troops a considerable portion is impracticable on account of deep arroyos without crossings.

The fact that egress to the east and north is cut off by the Missouri river, confines the operations to the west and south and renders it difficult to find a sufficient variety of logical suppositions on which to base general ideas for practical exercises.

If the course in practical work is to be enlarged in conformity with the improved program of instruction and the probable increase in the size of the garrison and of the units composing it, the use of ground outside the limits of the reservation will become very desirable. It is believed that permission to use the ground west to the Kickapoo road, southwest to Hund Station road, and south to Barnes road, during the season when there are no crops to be damaged, say from the middle of November to the end of March, could be secured by payment of a small rental, strict assurances as to entrance of premises, and agreement to repair damage to fences. Perhaps the same could be obtained in exchange for regulated grazing facilities, which would also improve the reservation by keeping down weeds and underbrush. There are many days in the late fall and even in winter in this latitude which, are well suited to the field exercises of small bodies of troops.

A march to Fort Riley, establishment of a camp, preliminary solution of tactical problems, and finally participation in the maneuvers, would bring about an ideal culmination of the course in practical work in this Department.

Very Respectfully,  
J. T. DICKMAN,  
Captain 8th Cavalry,  
Instructor.

**APPENDIX C.**  
*DEPARTMENT OF ENGINEERING.*

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General Service and Staff College,  
Fort Leavenworth, Kansas,  
July 23rd, 1903.

*The Secretary,*  
*General Service and Staff College,*  
*Fort Leavenworth, Kansas.*

SIR:

I have the honor to submit the following report of the work of the Department of Engineering of this College during the College year, September 1st, 1902 to July 23rd, 1903.

**PERSONNEL.**

Captain Thos. H. Rees, Corps of Engineers, Instructor.

1st Lieut. W. F. Nesbitt, 6th Infantry, Assistant Instructor until October 5th, 1902, when relieved owing to promotion and change of station.

Captain Edwin T. Cole, 6th Infantry, Assistant Instructor from October 6th, 1902.

1st Lieut. G. M. Hoffman, Corps of Engineers, Assistant Instructor.

1st Lieut. G. A. Youngberg, Corps of Engineers, Assistant Instructor.

2nd Lieut. W. Willing Corps of Engineers, Assistant Instructor .  
Student Officers.....96.

**TEXT BOOKS.**

Root's Military Topography and Sketching.

Beach's Manual of Military Field Engineering.

**FIRST SEMESTER.**

September 1st to Dec. 20th, 1902.

Subject: -Military Topography, to Chapter XXI, p. 290.

**THEORETICAL WORK.**

Half days .

20	advance lessons .....	20
7	partial review lessons .....	7
5	general review lessons .....	5
2	lectures	
	Total.. .....	32

**PRACTICAL WORK.**

Eight problems in surveying as follows :-

- 1 .-Compass Survey including contouring.
- 2.-Plane Table Survey including contouring.
- 3.-Transit and Stadia Survey including contouring.
- 4.—Leveling for profile and grade and cross-sectioning for contours.
- 5.-Measuring base line, Differential Leveling and Determination.

6 . - T r i a n g u l a t i o n .

7. Running Contours on ground with Transit.

8.—Sextant Survey by intersections from measured base, elevations with clinometer . .

The above problems included also prolonging a line, ranging out lines, measurements with tape and chain, and instruction in the care and adjustments of instruments.

Working hours were from 8 a. m. to 12 m. and from 1 p. m. to 5 p. m. Average time devoted to each Pproblem was four and one half days, half of which was field work and the other half plotting. The reduction of notes was done mainly at night.

Total time for practical work. . . . . 38 half days.

Theoretical work as above . . . . . 32 half days.

Examinations . . . . . 3 half days.

Aggregate first Semester . . . . . 73 half days.

**SECOND SEMESTER.**

January 1st to July 23rd, 1903.

Subjects:—

Military Topography, Part II. (Sketching).

Military Field Engineering.

Topography Part II :-Theoretical.

Half days .

7	advance lessons.. . . .	7
5	partial review lessons .....	5
4	general review lessons.....	4
	Total.....	16

**PRACTICAL WORK.**

Seven problems as follows : —

1.—Determine length of pace and construct working scale and scale of H. E. ....	Half days ,	1
2.-Road sketch with note book, compass and clinometer.....	Preliminary..	1
	Record.....	2
3.-Position sketch with field drawing board and compass.....	Preliminary .....	1
	Record.....	2
4.-Road sketch with sketching case..	Preliminary .....	1
	Record.....	2
L-Outpost sketch without instruments		
.....	Preliminary .....	1
	Record .....	2
6.-Road sketch, mounted, with sketching case	Preliminary .....	1
.....	Record.. .....	2
7.—Road sketch, mounted, with note book and compass .....	..Record.. .....	2
	Total.. .....	22

**FIELD ENGINEERING, THEORETICAL.**

13 advance lessons .....	13
9 review lessons .....	9
	<hr/>
	Total.....
	22

**PRACTICAL WORK,**

Field Fortification.

- 1.- Tactical location of trenches and field works.
2. Construction of trenches.
- 3.- Construction of high wire entanglement.
- 4.- Construction of low wire entanglement.
- 5.- Construction of loop holes on parapet.
- 6.- Construction of abatis.
- 7.- Construction of palisade .
- 8.- Construction of fascine.
- 9.- Construction of gabion.
- 10.- Construction of hurdle.
- 11.- Construction of revetments.
- 12.- Trace and defilade a field work.
- 13.- Construct profiles of field work.

Half days ,  
Time ..... 16

**MILITARY FIELD ENGINEERING;'**

- 1.- Use of cordage; knots, lashings and splices, use of tackle.
- 2.- Construct barrel raft.
- 3.- Assemble the canvas ponton.'
- 4.- Birago trestle bridge on land.
- 5.- Birago trestle bridge in water.
- 6.- Bridge 100 feet with canvas pontons.
- 7.- Bridge 225 feet with wooden pontons.
- 8.- Double-lock spar bridge with trestle approaches, length 175 feet.
- 9.- Pile bridge, length 137 feet. Half days.

Time ..... 12

**SUMMARY SECOND SEMESTER.**

**Topography, Part II :**

Half days.

Theoretical ..... 16  
 Practical.....18

**Field Engineering :**

Theoretical ..... 22  
 Practical ..... 28  
 Lectures ..... 2  
 Examinations.. . . . 3

**Total..... 98**

Total for year ..... 162.

The work in the Department during the past year was seriously interfered with by two circumstances.

First, a considerable number of the student officers were unable to report at the College at the beginning of the year and lost from one to two months of the course; They were required to make up this lost time during the remainder of the year, to the detriment of their marks and standing.

Second; a number of student officers were taken away from their college duties in order to undergo examination for promotion and were absent from one to two weeks; this also to their probable detriment in marks and standing.

It is most desirable in the interest of the College and of the student officers that nothing be permitted to interfere with or to interrupt the College work.

The work of the assistant instructors has been arduous and has been carefully and faithfully performed. :

Student Officers have shown great interest in the course and have, with few exceptions, performed their work with care, industry, and efficiency.

#### **RECOMMENDATIONS.**

It is the opinion of the assistant instructors of this Department, concurred in by the instructor, that the text book in Military Topography used during the past year has not been entirely satisfactory. No text book is known, however, which is one volume and within reasonable limits as to number of pages, covers this subject satisfactorily. It is recommended for the coming year that the course be supplemented by a series of lectures which may, with the approval of the Commandant of the College, be printed, and become part of the course with a view to their final publication in text book form in case they receive the favorable recommendation of the College Staff and approval of the Commandant.

There are subjects of study and practice which might advantageously be added to the courses of this Department, but the present college course of one year will not permit of any additions to the existing curriculum. In fact the time now allotted to Engineering is not sufficient for the proper and thorough treatment of the subjects studied and for the practical work connected therewith. Recommendations in the direction of an extension of the course in Engineering will therefore be postponed until a prospect of an additional allotment of time makes them pertinent.

Very respectfully,  
THOS. H. REES,

Captain Corps of Engineers, U. S. Army.

#### **APPENDIX TO REPORT OF INSTRUCTOR, *DEPARTMENT OF ENGINEERING.***

##### **PROBLEMS IN PRACTICAL WORK.**

The problems will be designated and referred to in schedules and instructions by the numbers set before them, as follows :

1. Length of pace and scales.
2. Road sketch, with note book, prism., or box compass, and clinometer.
3. Position sketch, with drawing board, box compass, protractor and scale.

4. Road sketch, with sketching case.
5. Outpost sketch, without instruments.
6. Road sketch, mounted, with sketching case.
7. Road sketch, mounted, with note book, compass and clinometer .
8. Road sketch, mounted, with note book and compass, barometer; distances by odometer on wagon.
9. Tactical location of trenches and field works. Construction of trenches.
10. Construct loopholes on parapet. Construct low wire entanglement.
11. Construct high wire entanglement.
12. Construct abatis and palisade.
13. Use of cordage.
14. Construct fascine and gabion.
15. Construct hurdles. Construct revetments.
16. Trace a fieldwork and defilade it. Construct profiles.

DATE.		Problems for Sections.			
1903.		1st & 5th.	2nd & 6th.	3rd & 7th.	4th & 8th.
Mar.	31. Tu. 1:00 p. m.	2	4	4	5
Apr.	1. W. 1:00 p. m.	3	4	5	6
"	2. Th. 1:00 p. m.	4	5	6	2
"	3. F. 1:00 p. m.	5	6	2	3
"	6. M. 1:00 p. m.	6	2	3	4
"	7. Tu. 8:00 a. m.	2	3	4	5
"	8. W. 8:00 a. m.	3	4	5	6
"	9. Th. 8:00 a. m.	4	6	6	2
"	10. F. 8:00 a. m.	5	6	2	3
"	13. M. 8:00 a. m.	6	2	3	4
"	14. Tu. 8:00 a. m.	9	10	11	7
"	15. W. 8:00 a. m.	10	11	7	9
"	16. Th. 8:00 a. m.	11	7	9	10
"	17. F. 8:00 a. m.	7	9	10	11
"	20. M. 8:00 a. m.	12	10	14	8
"	21. Tu. 8:00 a. m.	13	14	12	12
"	22. W. 8:00 a. m.	14	8	13	13
"	24. F. 8:00 a. m.	8	12		14
"	23. Tu. 8:00 a. m.	15	16	15	15
"	30. Th. 8:00 a. m.	16	15	16	16

If interrupted by rain on any day, the problem for that day will be omitted, and the schedule will stand as published.

Omitted problems will, if practicable, be taken up at the end of the season

Rainy days will be devoted to recitations in General Review, the first lesson for which will be in Root's "Military Topography and Sketching," Lessons 15 and 16 of Lesson sheet.

The second General Review lesson will be Lessons 21 "and 22 of sheet, and so on, two advance lessons at a time, through Root's Topography and Beach's Manual of Field Engineering.

The field uniform will be worn for all practical work.

The sections detailed for problems 6, 7, and 8, will be prepared for mounted work.

For the 8 a. m. reconnaissance problems, (2 to 8 inclusive), the sections will take lunches, and be prepared to stay out all day.

## . TOPOGRAPHICAL SKETCHING.

### (PRACTICAL.)

#### PROBLEM I. — DETERMINE LENGTH OF PACE.

The brick walk on Scott Avenue is 970 feet 4 inches long between the following points, viz:-from the stone cross curb at the northwest corner of Pope and Scott Avenues to the stone cross curb at the junction of Grant and Scott Avenue. The above distance is over brick only and is included between: the stone curbs mentioned.

The brick walk across the south end of the Main Parade is 524 feet, 2 inches long between the following points, viz: from the stone cross curb at the east end of the walk to the beginning of the stone crossing on McClellan Ave. This distance is over brick alone and is limited by the stone crossing at either end.

The above distances will be used for determining lengths of paces with careful attention to the following directions.

1. Take a natural swinging step that you could maintain for a long march.

2. Pace the distance yourself and do not permit your step or cadence to be influenced by others.

3. Pace each distance four times, twice on the walks and twice on the parallel roads between the same limiting lines. Do not neglect the last partial pace (one fourth, one half, or three quarters) that may finish the distance.

4. If the variation in the first set of four determinations is greater than two per cent, proceed with a second set of four determinations over each distance seeking greater regularity in length and cadence of pace.

5. A record will be kept on blank forms furnished, and results with scales will be submitted to instructors at recitations hours on March 20, original notes and results to be retained in note books.

## INSTRUCTIONS FOR PROBLEMS IN MILITARY TOPOGRAPHY---SKETCHING, PROBLEMS 2 TO 8

### INCLUSIVE. .

GENERAL INSTRUCTIONS:—The Sections will assemble at, 8 a. m., in their respective section rooms where the instruments will be issued by the instructors. Work on the day's problems will begin at once and will continue without interruption (except necessary time for midday luncheon in the field) until 6 p. m., when the sections will again assemble at section rooms and turn into instructors the sketches, reports, and instruments. In fairness to the whole class, work after this hour cannot be permitted and no work or instruments will be taken to quarters at any time. Omitted problems are not considered in averaging marks. Officers who so desire can make up omitted problems on Saturdays, and such work will be marked provided it is performed under the conditions and within the hours prescribed and provided a certificate to that effect is attached to the sketch. Unfinished sketches will, after they have been marked, be returned to the officers who wish to complete them at their leisure, but they must finally be turned in for examination by the College Staff. Such additional work will have no effect on marks.

All road sketches will be drawn to a scale of 3 in=1 mile with contours at 20 feet V. I.

Position and outpost sketches will be drawn to a scale of 6 in=1 mile with contours at 10 feet V. I.

All work will be done in pencil. Contours will be drawn in red pencil, Numbers or letters in circles, used for reference marks to reports will be in red pencil.

HH black pencils are best for this work. Keep all pencils well sharpened.

Show by conventional signs (see text,) the following incidents and features:—fenced or unfenced roads; bounding fences of inclosures, and whether stone, hedge, wire, or board; grass land; cultivated land; woods; cuts and embankments; gullies; farm and other buildings; villages; railroads; telegraph lines; streams; marsh; other incidents of water; bridges.

On every sketch place magnetic meridian; scale of H. E.; V. I.; scale of yards to read 50 yards.; R. F.; Title; thus:—“Problem No—, Road Sketch (mounted or foot) from---to ---, Date—,” or “Problem No- Position (or Outpost) Sketch, Place---, Date—,”

Sign official signature in lower right hand corner of sketch.

To every road sketch attach a sheet of paper containing the title of the sketch as above, and a report (see text) on roadway, bridges, rate of marching, towns and villages, character of surrounding country, streams, halting places, camping grounds, positions, lateral communications, railroads, telegraph lines, miscellaneous information; referring to places on the sketch by number in circles, thus—(4), in red pencil. Include only such of the above items as are applicable to the sketch. Attach official signature at bottom of report.

Signatures to sketches and reports will mean that the results submitted and signed are entirely the work of the signer and that no assistance or information has been received or used. If this is not the case state what assistance has been received, and sign.

For all problems student officers will provide for themselves and have always ready for use, 2 lead pencils (H H drawing are best) 1 red pencil, 1 eraser, 1 pocket knife, 6 thumb tacks, rubber bands, watch. Small springbow dividers are convenient for laying off H. E's. A small pocket tape 12 to 20 feet or a measured length of strong cord are often useful.

In mounted work the enlisted man who is detailed as assistant, will keep time, hold horses and assist as directed. He will probably know the gait at which the pair of horses was rated and should be depended on to keep that gait.

The working scales issued are made to a scale of 3 in=1 mile. For use in position and outpost sketching, double the count of paces or halve the numbers on the scale. The issued scales of H. E. are applicable to both purposes because while the scale is doubled the V. I. is halved.

In all road sketches the sketch will be extended laterally, by estimated or paced offsets, to a distance of 200 or 300 paces on either side of the traverse; at distances between 400 and 800 paces on either side, sketch only the more important details, locating them by estimation or by cross bearings.

In all problems use the instruments issued, in the prescribed manner.

Work independently, without reference to what others near you may be doing.

Prepare in advance for each problem by consulting the text book and by reading the instructions that pertain to the day's work.

It must not be understood that the outfit and method specified for any problem are the only ones suitable for that class of work. On the contrary, any of the outfits and methods are applicable to all the different classes of work. A road sketch may be made "without instruments," or with the drawing board, compass, etc., and the position or the outpost sketch may be made with the note book or with the sketching case.

#### PROBLEMS 2 AND 7.

Road sketch, foot or mounted, with note book, compass and clinometer.

Knowing the general direction of the road or route to be sketched, mark that direction (say S. W. or E., etc., **as the case may be**) at the top of the right hand page, then place the corresponding directions at bottom, sides and corners of page.

Note the readings of the compass for bearings N. E. S. and W., and place these readings on the appropriate divisions of the protractor near the corresponding letters. Finish **marking** the protractor at all 10 degree points.

At bottom of left hand page write place, date, name of sketcher, description of compass used, length of pace (or gait and ratio of horse) and designation of road to be sketched "—to—." At bottom of middle column, write station 1 and near bottom of right hand page assume a point for station 1. Record notes from bottom towards top of left hand page **and** carry the sketch along simultaneously on right hand page. The scale for this sketch should be about 1000 paces to one inch on foot; and about 8 minutes to one inch mounted, at walk.

Sketch free hand taking directions by eye from the printed protractor and distances by eye from the printed scale. Indicate hill forms and slopes by form-lines sketched free **hand** without attempting located contours. This sketch is intended merely as an aid to the memory and a guide to the eye **in** making the final plotted sketch.

At each halt record in middle column, distance along trail and new slope in advance; in adjacent columns record off sets, right or left and slopes right and-left,, and in outer columns,,

record description of objects located, and bearings and descriptions of more distant objects. When the halt is at a station, add to the above notes in middle column the number of the station and the bearing of the new course. Bring the sketch up to the 'point of halting.

On pages following the sketch, enter notes that will be needed in preparation of descriptive report, with proper reference numbers to sketch.

When three miles on foot or five miles mounted are completed (but whether completed or not never later than 1:30 p. m.) cease field work and return to Sherman Hall. At drawing desk in draughting room plot the day's work. Plot first the traverse line with check bearings, go through notes a second time and plot offsets, and side bearings and distances, and sketch the located details. Go over notes a third time and with recorded slopes and scale of H. E., dot in, the contour points on the traverse line and side shots, and mark their heights, assuming height of station. 1 to be, say 800 feet. Sketch contours in red pencil shaping them by reference to form lines of book sketch. Complete sketch and report and turn in work in accordance with "General Instructions," at 5 p. m.

### PROBLEM—3;

Position sketch with drawing board, box compass, protractor and scale.

The position to be sketched will be selected and indicated by the assistant instructor. The portion allotted to one sketcher should extend not less than one mile in length and not less than three-quarters of a mile in depth.

Select a suitable base line, from the ends of which good views of the position can be had, and about 700 to 900 yards long. Occupy initial station at one end of base and read and plot bearings of base and of lines to points selected as check points. Read the vertical angles to the same points and record them+or-on the plotted lines. Run a traverse to other end of base, halting at suitable points to determine neighboring features and slopes. Sketch them in as soon as determined, using red pencils for contours and black for everything else. The traverse along the base should be straight, if possible, but this is not absolutely necessary.

At other end of base read and plot bearings of base and of lines to selected check points. Read vertical angles to

same points and record same on plotted bearings. The intersections will determine the position of check points and their elevations can be determined by laying off the H. E.'s, and counting 10 feet V. I. to each H. E. taking the mean of the two determinations for the height of each check point.

The foregoing operations correspond to measurement of base, triangulation and leveling of an instrumental survey and there has already been accomplished the filling in of details along the base line. Next run traverses, preferably along ridges and spurs and along water courses, taking care to begin and end each traverse at base or check points. Halt whenever it is necessary, to determine adjacent features and slopes; plot the halting point, and then sketch the surroundings as determined by offsets or by bearings and distances; and plot contour points by slopes and H. E. Draw contours as soon as sufficient C. Ps. are located, studying the shape of the ground to determine shape of contours.

Run the traverse lines in such wise as to add to and build upon the areas previously covered, not covering the same ground twice.

Some topographers prefer to run parallel traverse lines at regular intervals, but it is better to select lines that will determine as large an area as possible on either side and for this purpose water sheds and water courses are the best lines to run.

When the sketching and the filling in with conventional signs are completed, finish the map in accordance with "General Instructions" and write on separate paper a brief report describing the advantages and disadvantages of the position; the character of the surrounding country; the communications, front, rear and lateral; artillery positions; obstacles; materials available for defensive purposes; and miscellaneous information of military application.

Cease work in time to submit results in section room at 6 p. m.

#### PROBLEMS 4 AND 6.

Road sketch, on foot or mounted, with sketching case.

The scale, the V. I., the general principles involved, the purpose? and the details to be included, are the same for both sketch and report, as in problems 2 and 7, q. v.

At the initial station, 1, face squarely in the general direction of the route to be sketched. Hold the sketching case in

normal position (compass to right) squarely in front of you and turn the bars or lines of compass box to a position parallel with the needle, and be careful throughout the work not to change these bars or lines. Place the ruler parallel with bars or lines and draw line to represent magnetic meridian, Mark north end with half arrow head. Assume point near middle of near edge for station 1. Face squarely in direction of first-course; orient the board; point the ruler along first course to station 2 (glancing at compass to keep oriented) sliding it to place its edge on station 1. Clamp ruler and arm and draw line from station 1 toward station 2. Take side shots, if necessary, always facing in desired direction and re-orienting the board. Read slopes and set off corresponding H. E's. front, right and left. Sketch adjacent features and contours.

Pace (or time, if mounted) along road toward station 2. Halt whenever necessary, to determine adjacent features or new slopes. Plot halting point first and then sketch surrounding features and contours. When the halt is at a station where the traverse turns to a new direction, number the station and plot new direction as at station 1. Keep the sketch fully up to halting points but not much beyond.

Take frequent check bearings at distant land marks, even if beyond limits of paper. In note book, jot down remarks and memoranda for report. If the sketch runs off the paper, draw a cross line to end it and begin anew as at first station, with a new orientation and meridian if necessary.

Having finished four miles if on foot, or seven miles if mounted, complete the sketch in accordance with "General Instructions" and write report. Cease field work in any event, early enough to turn in results at section room at 5 p. m. Allow, for returning, 18 minutes per mile: if on foot and 8 minutes per mile if mounted (trotting.)

#### PROBLEM 5.

Outpost sketch without instruments.

It is assumed that in actual service, an officer, being without any sketching instruments, will improvise the following outfit: the open note book or a pad of paper, or a small piece of board with paper attached, to be used as a plain table; a piece of paper folded several times, or an extra pencil, or a piece of wood whittled straight and flat, to be used as a ruler or alidade: the known length of a finger or of the span of

the hand will serve as the basis of a scale of inches, and with this a working wale of paces can be constructed and laid off on edge of ruler; three sticks tied together near the top and spread apart at the foot will form a convenient support for the plane table; select an edge of the board. or pad that is straight and at its middle point drop a perpendicular six inches long; at its extremity lay off on perpendiculars to right and left, divisions of one tenth of an inch, each representing 1 degree for a center at the point; first assumed; with a piece of string tied to a stone, knife, or key, the slope board is completed.

In working this out as a problem, the field drawing and slope-board will be used in lieu of the pad or improvised board. All else will be improvised in the field except that tripods may be prepared beforehand if desired. Every officer is supposed to have, at all times, a pocket note book, pencils, and knife. The issued scales of H. E. will be used. Assistant instructors will select and indicate the outpost to be sketched. Proceed to the assumed position of the picket. Prepare first a scale of inches and tenths as accurately as can be estimated, and then construct a working scale of paces at 6 in-1 mi., to suit length of pace. Mark this scale on edge of improvised ruler. Advance to assumed line of observation and select a station, giving good view, as one end of base. Set up the board as a plane table and assume a point for station occupied. Sight toward all points which it is desired to locate and draw the corresponding lines; read vertical angles to same points and record them along the corresponding lines. Sketch the neighboring details and contours: run a plane table traverse along the line of observation, plotting courses, distances, details and contours, at suitable halting and station points as it proceeds. As distant points toward the front hitherto invisible, come into view, plot their direction lines and record vertical angles and remember' to get intersections on them from another point of traverse. Select the final station with reference to getting a good view and make it the end of the base line just traversed. The base line traverse need not be a straight line. Its length should be from 600 to 800 yards.

At this base station, orient the board carefully and plot direction lines toward all points previously sighted, thus determining them by intersections; read and record vertical angles to same points; having assumed. height of first base,

station at say 800 feet, that of the second base station becomes known by slope and H. Es. between them. Lay off the proper H. E. along each direction line and thus determine heights of intersected points; adopt the mean of the two determinations. Fill in by sketching intermediate details with reference to plotted points : interpolate C. Ps., and sketch contours, shaping them by careful study of the ground. Finish the sketch in accordance with "General Instructions" (an approximate true meridian may be determined by watch and sun.). Write report similar to that required for the position sketch, Problem 3. Turn in work in section room at 5 p. m.

NOTE—In the case of the outpost sketch it is assumed that the ground in front of the line of observation cannot be traversed, owing to the presence of the enemy.

PROBLEM 9.

(A. M.) Tactical Location of Trenches and Field Works  
8 a. m.

The sections will proceed to the field with the assistant instructor, who will select and point out a position which is to be occupied and hastily fortified. The sections will then be extended at from 50 to 100 yards intervals, each officer posting himself without reference to his neighbors, at a point which he selects as the proper location for the trench. He will study the ground about him and be prepared to answer questions on the following points or such of them as apply to the locality ;-

Reasons for selecting the point occupied.

Direction of trace of trench and whether straight, salient, or reentrant: continuous or with intervals.

Dead spaces or sectors without fire, cover or screens for enemy, obstacles, commanding points.

Kind of trench suitable for locality, material available in vicinity for defensive purposes.

Any places in front that should be held as advanced posts.

Posts of supports and reserves.

Any good sites or necessity for field works or artillery positions in immediate vicinity.

Other questions suggested by surrounding features and incidents.

As soon as the extension is begun the instructor will follow along the line, assembling the section as he goes, and questioning each student officer in succession on the above points.

As soon as the sections are assembled the exercise may be repeated on another line if time permits. The assembled portion of sections will be attentive to questions, answers and explanations, and ready to answer questions that may be passed around.

(P. M.) Construction of Trenches.

Assemble on Engineer Hill (between the two branches of Merritt Lake) at 1:15 p. m. Having taken tools, (pick and shovel) the sections will be extended on the military crest at 5, foot intervals, determined by extending the arms laterally, knuckles touching. The alignment is verified and corrected by the instructor who will then direct work to begin.

The line of the toes will be the cutting line for front of trench, and a line from front to rear between the heels will mark the left of each task. Trace these lines by scoring through sod with pick; front to rear 6 feet on left of task; then cutting line left to right 5 feet joining those of adjacent tasks.

Dig the lying trench, at first only 3 feet wide from left to right of task. This gives partial cover quickly, prevents interference of adjacent diggers, and defines the tasks clearly. Then finish the remaining two feet on right of task. Maintain a mark on the berm to show left of task.

As soon as the instructor has verified the form and dimensions of the lying trench he will direct work to commence on the kneeling trench. Dig first the three feet on left of task and then the two feet on right. After verification by instructor, proceed, at his signal, to excavate the standing trench, digging first the three feet on left of task, then two feet on right.

After final verification the tools will be turned in and the sections dismissed, not later than 5 p. m.

### PROBLEM 10.

(A. M.) Construct Loopholes on Parapet.

For the first half day's work on this problem the sections will assemble at 8: 15 a. m. on north Merrit Hill where old trenches are found. On succeeding days the assembly will be on Engineer Hill, where the parapets constructed on previous days will be loopholed.

The sections will be divided into parties and designated to construct loopholes.

1. With sandbags.

2. With sod.
3. With head log.
4. With hoppers of boards

alternating in rotation as time permits. Instructions in detail will be given by instructors.

(P. M. Construct Low Wire Entanglement.

Assemble on Engineer Hill at 1:15 p. m. Secure tools and material under direction of instructor, who will assign different portions of the work to the several organized parties and will supervise the work. Each member of the sections is expected to be familiar with the details of construction and to be able to proceed with his allotted task without special instruction. Construct entanglement of six rows, six stakes in a row.

#### PROBLEM 11.

Construct High Wire Entanglement.

Assemble on Engineer Hill at 8:15 a. m. and 1:15 p. m.

. Same instructions as for low wire entanglement.

GENERAL INSTRUCTIONS FOR PROBLEMS 9, 10, AND 11.

Prepare in advance for each half day's work by consulting text and reading instructions.

The sections will be dismissed at 12 m. and 5 p. m., or earlier if the work is completed.

#### PROBLEM 12.

(A. M.) Construct Abatis.

The section detailed for this problem will assemble in front of Post Administration building and proceed with assistant instructor to the woods at the nearest point where suitable material can be found and cut.

Assume a line to represent trace of trench or field work and make necessary assumptions as to probable lines of approach of enemy; Locate the abatis with proper reference to those lines and begin construction. Working in pairs equipped with axe and hatchet cut, trim off twigs and small branches, and drag into place, small trees or large branches; arrange them on the selected line, interlacing the branches. As soon as one row 25 yards long is laid, stake it firmly with crossed stakes or hooks cut from branches. Lay a second row in the same manner overlapping the butts of the first row and stake it fast. Interlace both rows with 5 or 6 lines of wire.

The trees to be preferred for this purpose are those of a stiff scrubby, straggling growth, with many branches. Thorny trees are best. The diameters of the butts should be from 4 to 6 inches.

If sections are reduced in numbers by absentees a proportional reduction in length of task will be made.

When completed test the efficiency of the obstacle by trying to penetrate it quickly.

P. M. Construct Palisade.

Assemble on Engineer Hill at 1:15 p. m. Secure tools. The line of the palisade being scored on the ground dig a trench twelve inches wide and two and a half to three feet deep, and in length one foot to each member of sections present. Throw the earth to the rear. Then, working in parties of five or six, each party will build and erect a section of palisade as follows: point the tops of six twelve foot posts. Lay them on the ground, points to the front and butts near the trench, with spaces of about five inches between posts, cut two string pieces of poles six feet long and flatten one side.

Lap them across the posts, one foot from tops and eight inches from butts. Spike them to every post. Carry the section of palisade to its place, raise the top and slide it into the trench. Align it, steady it in a vertical position and throw in enough earth near the middle to stay it till adjacent portions are set and aligned; then fill in all the excavated earth and tamp it firmly with bars. Spike on short pieces of pole to connect stringers of adjacent portions.

PROBLEM 13.

A. M. and P. M. Use of Cordage.

Assemble in rear of Sherman Hall at 8:00 a. m. and at 1:15 p. m.

There will be detailed twelve non-commissioned officers and men of the engineer battalion each of whom will be prepared to show the correct method of making a certain set of knots, lashings and splices, viz:

1. Whipping, seizing, overhand knot, rolling hitch, figure eight.
2. Short splice, eye splice, strap.
3. Long splice, square or reef knot.
4. Sheepshank, round turn and two half hitches, clove hitch, timber hitch.

5. Weaver's knot or sheet bend, double sheet bend, Carrick bend.
6. Bowline, bowline on a bight, wall and crown.
7. Cat's paw, blackwall hitch, mousing, lark's head.
8. Square lashing, shear lashing.
9. Gin lashing, sling for barrels open or headed.
10. Reaving tackle, names of parts, snatch block, "round in," "overhaul?" "two blocks;,, power of tackle, field capstan (Spanish windlass.)
11. Balk lashing, rack lashing (on side rails.)
12. Fisherman's bend or anchor knot, mooring knot.

Student officers, in parties of two, will, for thirty minutes at each station, learn and practice the knots, lashings, splices, etc., there shown, and will then pass on, at word from the instructor, to the next station, and so on through the cycle, in six hours.

Then for two hours the instructor will examine his sections in their proficiency.

Calling for a certain knot, lashing, or splice, etc., to be made simultaneously by all members of the sections, he will after a specified time examine the results, and repeat the exercise in such variety and extent as time will permit. Marks will be based on these results and on the attention and interest displayed during the previous practice.

#### PROBLEM 14.

##### A. M. Construct Fascine.

Assemble on Engineer Hill at 8:15 a. m. The sections will be divided into parties of five or six men each. Each party will proceed as follows:—Secure tools and material; erect trestles for fascine rack; construct one fascine as described in manual; place it on the pile with others; dismantle the trestles; return tools; dismissed.

##### P. M. Construct Gabion.

Assemble on Engineer Hill at 1:15 p. m. The sections will be divided into parties of four or five men each. Each party will secure the necessary tools and material and will construct one gabion as described in the manual; then place gabion in pile with others, return tools, and be dismissed.

#### PROBLEM 15.

Revetments are usually applied to the interior slope of the parapet of a "field work,, and should be constructed at the

Same time with the parapet, For purpose of illustration, however, revetments will be constructed against the front of the standing trench.

Assemble at Engineer Mill at 8:15 a. m. and 1:15 p. m.

The following instructions apply to two sections.

Hurdle revetment. Tools: -three hand saws, six picks, ten shovels, four axes, six hatchets, eight mallets, four mauls, eight gabion knives, thirty six pickets two inches in diam., five feet long; brush one inch diam. at butt.

Cut away the front of the trench six inches and trim to a slope of three on one for a length of thirty six feet, throwing the earth on top of the parapet, drive the pickets with the same slope, five inches from the earth slope, and at intervals of twelve inches. For weaving the hurdle, the detail will be divided into three equal parties.

The first party will bring the brush, see that it is properly trimmed, and pass it over the heads of the weavers (second party) as needed.

The second party working at intervals of five feet, receives the brush and weave it by randing in and out between the pickets.

The third party, with mallets, working in the intervals between the members of the second party., will force the woven brush down and settle it in place with mallet,

Each member of the second party will begin at the left of his five pickets, with the butt of a rod, and weave five pickets to the right, keeping the butt of the rod down and the top well raised. Do not follow the rod to its end, but pass it to the next weaver at the fifth picket.

The members of the third party will assist in the weaving, each confining his work to the five feet allotted to the weaver on his left. All of the second and third parties working together force the woven rods down, and the third party settle them snug and close with mallets.

When the first line of rods is woven and settled in place, each weaver starts a new rod in the same manner, except that he begins at the second picket of his five instead of the first, and so on, alternating, always starting the butts on the front side of the picket.

At the left of the hurdle, however, all rods are started on the first picket alternating front and rear.

At the right of the hurdle the smaller brush or rods will be bent around the last picket and woven back; the larger rods will be cut off.

Finish to a height of four feet above the banquet tread. Sew with withes or wire down two feet from top. Saw off the tops of the pickets. Fill back with the earth thrown on top of parapet and trim the superior slope, laying sod at the interior crest. When filling in with earth, spring the hurdle back to a slope of four on one, and anchor it in this position with wire to stakes driven in parapet.

The three parties will change posts at the completion of each third of the hurdle.

Construct Revetments with Fascines, Gabions, Sand Bags and Sod.

The following instructions are for two sections divided into three parties of seven or eight men each.

First party. Fascine Revetment. Tools:—four picks, four shovels, three mallets, two cutting pliers, one hundred feet of wire, thirty pins, one inch in diameter, twenty inches long; ten stakes, two inches in diameter, two feet long; five fascines cut to a length of nine feet; two hand saws.

Cut away the front of trench nine inches for a length of ten feet and trim to a slope of three on one, throwing earth on top of parapet. Place the first fascine against foot of slope sinking it three inches in banquet. Drive twenty inch pins through fascines into earth. Level up with earth and lay next fascine, making the slope of the revetment equal four on one. Fill in with earth and drive pins diagonally through fascine into earth. Continue in same manner to include the fifth fascine, anchoring the third and fifth fascines with wire to stakes driven firmly in parapet. Fill in with earth to the top of each fascine as laid. Finish off the interior crest with two layers of sod and trim the superior slope.

NOTE:—In a continuous line of fascine revetment the fascines would break joints in successive layers, and would be full length of eighteen feet.

Second party. Gabion revetment. Tools:—four picks, four shovels, two fascines cut to length of nine feet; four gabions.

Cut away the front of the trench fifteen inches for a length of nine feet, throwing earth on top of parapet and trimming to slope of three on one.

Lay a nine foot fascine at the foot of the interior slope sinking it three inches in banquet. Set four gabions on the fascine and after partially filling with earth adjust them to a slope of four on one. Fill back with the earth thrown on parapet. Cap the gabions with a nine foot fascine, level up with earth and trim the superior slope, laying sod at the interior crest over fascine.

Third party. Sand bag revetment. Tools:-four picks, four shovels, one hundred sand bags.

Cut away the front of the trench fifteen inches for a length of twelve feet throwing the earth on top of the parapet, and trimming to a slope of three on one. Lay up the revetment of sand bags with a slope of four on one, in headers and stretchers, breaking joints in successive layers, and filling back with earth as the revetment rises. Finish off at a height of four feet four inches and trim the superior slope.

The party that finishes its revetment first will proceed to the sod revetment:

Tools--four axes, six picks, six shovels.

One half the party will cut one hundred and twenty sods four inches by nine inches by eighteen inches. The other half will cut away the front of the trench fifteen inches for a length of six feet trimming to a slope of three on one and throwing earth on top of parapet. The party will then lay up the revetment of sods to a slope of four on one, in headers and stretchers, breaking joints in successive layers, and filling back with earth as the revetment rises. Finish off with headers, grass up at a height of four feet four inches, and trim the superior slope.

The three parties will then rotate in the different tasks as time permits. For all but the sod revetment, the revetments first constructed may be taken down and rebuilt by successive parties. The form and dimensions of the trench and parapet must be preserved throughout the work.

#### PROBLEM 16.

Trace and Defilade a Field Work and Construct Profiles.

Assemble on Engineer Hill at 8:15 a. m. and 1:15 p. m.

The work to be traced and profiled will be a lunette with faces 61 sixty yards and flanks of thirty yards. The faces will make with the capital an angle whose tangent is three on one. The flanks will make with the direction of the capital an angle whose tangent is one on two.

Two sections will work on the right of the capital and the other two on the left.

Select a point for the salient angle such that the slopes in front (generally towards the south) will be seen from the finished parapet. Direct the capital upon the new Federal Prison and trace it on the ground.

The following instructions apply to two sections and to their half of the work.

Tracing:—Lay off from the capital, at the salient, the face angle of three on one. Trace the line of interior crest so determined with tracing tape, to a length of sixty yards, fastening the tape by a turn around pegs at twenty yard intervals. At the shoulder angle, lay off from the direction of the capital, the flank angle of one on two, and trace the interior crest of the flank to a length of thirty yards, fastening the pegs at fifteen yard intervals. Next trace the exterior crest on a line parallel to the trace of the interior crest and twelve feet therefrom, with pegs opposite those of the interior crest. At the angles of the trace the pegs will be on the line that bisects the angle. Erect twelve foot posts (two inches by four inches) at every peg of interior crest. Trace the gorge by a single line of tape, with pegs at twenty yard intervals.

Care must be taken to lay all tapes flat on the ground and to avoid disturbing the tape after it is laid.

Defilading:—Plant firmly, two six foot poles, twelve feet apart, on the gorge line, and stretch a string at a height of three feet six inches above the ground. Plant a third pole ten feet to the front and carry the strings to it. Sight from the gorge line to the hill top in front, as determined by trial, which has the greatest command, and adjust the strings on the front pole in the plane thus determined. This fixes the tangent plane, and the plane of defilade must be four feet six inches higher. Sight in the plane of the strings to the posts on the trace of the work and mark the points of intersection. On each post measure four feet six inches higher and the points so determined will fix the height of the interior crest.

Profiling:—The sections working on the right of the capital will construct profiles on the capital at one post of the face, at the shoulder angle, at the middle of the flank and at the rear end of flank; five profiles for five parties of four or five men each.

The sections on the left of the capital will construct profiles at the two posts of the face, at the shoulder angle, at the

middle point of the flank, and at the rear end of the flank; five profiles for five parties of four or five men each.

Each party will construct its profile as shown in the Manual, except that a diagonal brace will be inserted between the uprights at the interior and exterior crests, and extended to the rear, will be nailed also to the uprights of the banquet. When the profile is erected, side braces will be added to keep it vertical.

### **PRACTICAL WORK--MILITARY BRIDGES.**

#### **PROBLEM 17.**

##### **a.-Construct Barrel Raft.**

Two sections will construct a raft of ten barrels as described in Manual, par. 330 and Plate 43, figs. 1 and 2. After completion the raft will be dismantled, except the last two which will be framed together, side by side, with five cross transoms lashed to gunwales. On the transoms will be lashed two gunwales to support balks of roadway. This double raft will be subsequently used in a floating bridge.

##### **b.-Assemble the Canvas Ponton.**

Each section will assemble a canvas ponton, floor it with two chess, launch it, equip it with cable, anchor, paddles and bailing scoops, and will ferry across Merritt Lake and back. The ponton will then be hauled out, dismantled and all its gear stored.

##### **c.—Birago Trestle on Land.**

Two sections will lay an abutment sill and construct two bays of trestle bridge on land to illustrate its use in crossing gullies or building ramp for loading stock on trains. Dismantle and return material.

##### **d.-Birago Trestle in Water.**

Two sections will lay an abutment sill on bank of lake and will construct two bays of trestle bridge in water using a pontoon raft.

Sections first and fifth, second and sixth, third and seventh, fourth and eighth, will begin respectively with a, b, c, and d, of Problem 17 and will rotate in that order till the cycle is completed in two half days; i. e. two hours to each part of the problem.

PROBLEM 18.

a.-Bridge with Advance Guard Equipage.

Four sections will construct the bridge across the north branch of Merritt Lake. Detailed instructions will be given on the ground. When completed the bridge will be dismantled and all material returned. Time one half day,

b.-Spar Bridge, Double-Lock.

Four sections will construct a double lock spar bridge across south branch of Merritt Lake. Two sections will work on north bank and two on south bank. Time, one-half day. The bridge will be completed by the other four sections on next half-day. Detailed instructions will be given on the ground.

The first fifth, third and seventh sections will begin with "a," and the second, sixth, fourth and eighth, with "b" alternating on second half-day.

PROBLEM 19.

Bridge with Reserve Equipage.

The whole class will be drilled in the construction of the Ponton Bridge, on two half-days, with such rotation of duties as will give experience in all parts of the work-

PROBLEM 20.

Bridge with Pile Trestles

The trestles consist each of five vertical piles and are spaced twelve feet six inches from c. to c. In each trestle the piles are spaced three feet two inches from c. to c. The caps are flattened on top and bottom to a thickness of about six inches and are drift-bolted or pinned to tops of piles. All trestles are braced to two diagonals spiked to piles. The balks are fifteen feet long and are laid five in each bay at intervals of 2 feet eight inches c. to c. The outer ones are drift-bolted or pinned to the caps and the three inner ones are lashed to hold them in place.

The flooring is made either of three inch by thirteen foot poles or of two inch plank. It is held in place by side rails of poles laid over the outer balks and lashed thereto near trestle bents and at middle of each bay. The abutment sills are caps sunk in the ground and firmly staked front and rear. If a shore trestle is needed between the abutment sill and the water, it will consist of a mud-sill, five posts, a cap and two diagonal braces,

Each bay of the bridge is constructed as follows :-Build a frame consisting of a cap, the two outer balks, a ledger and a diagonal. Carry it forward and engage the ends of the balk under the previous cap to which they are temporarily lashed. Revolve the frame to its place by hauling out on a fore-stay and then lowering by the back stays, using a derrick frame to take the weight. Lay a temporary flooring of four planks or chess. Set the piles from the outer end of the suspended frame, drive them, and saw them off. Shift the frame to place the cap on the piles and drift bolt or pin through cap into top of piles. Lay three more balks and lash them. Floor half the new bay. Brace the trestle with two diagonals spiked to piles. Proceed with next bay in same manner.

**WORKING PARTIES.**

NO.	DUTIES.	NO. OF MEN.	FROM SECTION.	
1	Prepare caps.	4	8	3 parties of 4 each
2	Tackle and holdfasts.	12	4	
3	Abutment and side rails.	4	8	
4	Prepare piles.	4	8	
5	Derrick.	6	6	
6	Frame builders.	10	5	2 parties of 5 each
7	Balk and frame carriers,	72	1	
8	Floor and pile carriers.	11	2	Total 16
9	Floor layers.	5	6	
10	Drive piles with mauls.	2	7	
11	Mark and saw piles.	5	3	
12	Augers and sledges.	5	7	
13	Boat crew and braces.	5	7	

**Instructions for Working Parties.**

**I. Cap Section.** (Four men, eighth section.) Prepare trestle caps.

**Tools:-**One cross-cut saw, one axe, one adze, one cant hook, two scratch awls, one chalk line, two augers three-quarter inch, one measuring rod, fifteen feet marked on face at center and at intervals of three feet two inches from center, and on edge, at center and at intervals of two feet eight inches, one rule two feet, one level, one hammer, nails 8d. one square.

Lay cap on skids and chock. Saw to length of fifteen feet. **Across** ends near top and bottom draw horizontal lines to determine required thickness, six inches, or tack on short six inch boards. Snap the chalk line horizontally to determine top cutting lines. Flatten down to these lines with axe and adze. Roll the cap over and flatten other side in same manner. The cap will now be of uniform thickness and flat on top and bottom. On center line of top bore three-quarter inch holes vertically at center and at intervals of three feet, two inches from center. Mark with chalk on top, cross-lines at two feet eight inch intervals from center, for balk.

2. Tackle Section (twelve men, fourth section, three parties, four each.) Four will rig and man upstream backstay, four rig and man downstream backstay, and four rig and man forestay across the stream. Each party rigs its own tackle and sets holdfasts. The backstay holdfasts are set eight feet on either side of axis of bridge and thirty feet back from the abutment sill; each holdfast is a four inch by five feet stake driven three feet in ground and tied back to second stake. Rig a strap of three quarter inch rope to hook tackle into. Reave double tackle of three quarter inch rope three hundred feet long in six inch blocks, and hook to holdfast and backstay. Backstay is two hundred feet of one inch rope doubled or one hundred feet of inch and a half rope with large eye at end. When a frame is in place, put bight of eye of backstay over end of cap and stand by to take strain when frame is heaved over; then when derrick is set, lower away to place. Stand by to raise and lower as required. For the forestay a similar holdfast is set across the stream, in axis of bridge fifty feet from water. Rig tackle of 300 feet of three quarter inch rope in double and single six inch blocks, and hook to strap (three quarter inch) on holdfast and to forestay which is a one inch line leading across stream to cap of frame. When frame is adjusted heave it over and stand by to haul it out in place when piles are bored. Each of these three parties will require one axe, one maul, one crowbar, and blocks and ropes as specified. The forestay party will lay the abutment sill on their side. (See abutment section.)

3. Abutment and side-rails. (Four men. Eighth Section.)

Tools: —One pick, two shovels, two mauls, one level, one square, lashings and rack sticks, range stakes. (P) Range out axis of bridge.

Dig trench perpendicular to axis of bridge and extending eight feet each side thereof, eighteen inches wide, nine inches deep, bottom level. Lay abutment sill (a cap not bored) in trench; level and square. Stake with eight three inch by four foot stakes, four in front and four in rear of sill. Back-fill with earth and tamp hard.

As soon as a bay of the bridge is completely floored, lay side rails (three inches by sixteen feet, placing them symmetrically over the outer balks; lash near caps of trestles to include two balks and two side rails where they lap, and at middle of balk. Lashings are of one half inch rope eighteen feet long with eye-splice in one end. Take at least three turns and tighten with rack stick.

#### 4. Preparing piles. (Four men, eighth section)

Tools:-One cross-cut saw, two axes, one adze, one tape, two cant hooks, one drawing knife. Sharpen the butt ends of piles to a conical point one foot long. Get depth of water for next bent from boat crew, and cut five piles for that bent to a length equal to the depth of water plus eleven feet.

#### 6. Derrick section (six men, sixth section.)

Tools:-Two hand saws, two sledges, spikes six inches, lashings, measuring rod or tape.

The foot of each leg must be finished off with jaws to embrace the cap of a trestle and revolve on it. Flatten the front and rear sides of the legs for four feet to good bearing surfaces. For each leg bevel to a flat surface two pieces five feet long and five in diameter making the level four feet long. Spike these pieces to the flattened faces of the leg, letting them project twelve inches beyond it. Cut away the inside of these projecting ends so that their clear opening will be nine inches.

Build frame as follows :—Two legs, twelve feet six inches by four inches at top, laid parallel, thirteen feet eight inches between centers. Spike and lash (one half inch rope) a transom, three and a half inches by fourteen feet eight inches across the legs, six inches from top. Spike and lash (one half inch rope) diagonals three inches by sixteen feet from points near transom to points six feet below transom: lash (one half inch rope) diagonals at crossing; square lashings. Attach one half inch lashings twelve feet long to transom near each leg.

When a balk frame has been set and heaved over, carry the derrick frame forward, legs in advance and set jaws of legs over trestle cap. Lift the transom end to the backstays and lash with the one half inch lashings. The derrick frame thus becomes a rocker arm for lowering the balk frame to place. Lay five planks from cap to cap as a temporary flooring of the new bay. When the balks of the new bay are laid, lash the three inner lines of balk to cap with two turns and frappings of one half inch rope twenty eight feet long to hold them in place.

6. Frame builders. (Ten men, fifth section, two parties of five men each.)

Tools for each party:—One measuring rod fifteen feet long marked on face, at center and at six feet three inch intervals each side of center and on edge, at center and at four feet three inch intervals each side of center, four augers, three quarters of an inch, four sledges, three-quarter inch drift bolts twelve inches long, spikes six inches, tape, one cant hook, two crow bars, one maul, one hand saw, one square.

The first party (words in parenthesis apply to second party.) Lay two six inch by fifteen feet skids on ground, parallel with stream and twelve feet apart., bring the ends even, block them up to a level and stake them fast. Mark points on each skid five feet four inches each way from center line and cut shallow notches about three inches wide. On these skids build the frames as follows: Lay two balks, butts (tops) toward the river, in notches on skids; cut to a length of fifteen feet, but do not discard a balk three or four inches short; mark points on each balk six feet three inches from its center. Lay a cap, marked side down, over marks near tops (butts) of balks, shift the cap till its outer marks are even with the upstream (downstream) side of the balks; bore vertically and centrally through cap and balk at crossings, three-quarter inch holes, and drive twelve inch drift bolts. Bore holes vertically through balk at the other six feet three inch marks. Spike on a ledger three inches by thirteen feet across the balks at a distance of four feet three inches from centers of balks toward the butts (tops.) Spike on a diagonal, three and a half inches by fifteen feet from a point on the downstream (upstream) balk near ledger to a point on the upstream (downstream) balk near cap. The ends of ledger and diagonal should be slightly flattened and

two spikes used in each end. Be sure that the distance between the upstream (downstream) sides of the two balks is exactly ten feet eight inches. If greater than this, trim off the upstream (downstream) balk; if less, trim off the downstream (upstream) balk at the ends for a distance of three feet.

Attach five lashings, three-quarter inch ropes twenty two feet long with eye splice in end, to cap at points three inches upstream from drift-bolt holes. Pass each around the cap, reave end through eye, haul taut in place, coil and stop. Attach two lashings of one inch rope twenty five feet long to the two balks just outside the drift bolt holes in the butts (tops) by throwing a clove hitch at the middle point of the lashing and slipping it over end of balk to proper place leaving two free ends. When a frame is finished lay it to one side, without turning, and build another.

#### 7. Balk and frame carriers. (Twelve men, first section.)

Get the first frame from the first party of frame builders, the second from the second party, third from first party, and so alternate. When a frame is called for, lay hold, facing the stream as follows—five men behind cap, two men in front of cap lifting balks, three men behind ledger and two men at front ends of balk. Lift together and carry frame to its place on the bridge, lower the front end and rest the ledger on the balk of the previous bay. A frame received from the first party of frame builders lies on the downstream side of the balk of the previous bay; one from the second party lies on the upstream side. Raise the rear end and slide forward to engage the balk under the cap of the previous bay. Fasten by upward and outwards turn of lashings around cap. The middle cap-carrier will disengage the forestay and fasten it to the new cap six inches from center by a round turn and two half hitches. The outer cap carrier will disengage the backstays and loop them over ends of new cap. Then as the forestay is tightened and the backstay slacked off, lift the frame and help heave it over. Go ashore and lay out three balks ready for use.

If for filling a frame built by the first party, lay tops foremost; if for a frame of the second party, lay butts foremost; Get carrying bars two and a half inches by three feet six inches with a one-half inch lashing attached near center. Lay bars across the balks three feet from ends, pass lashings under and stop with a few turns around bar. When balks are

called for, lay hold, four men to each balk. The middle balk goes in advance and is laid in place with proper lap. Its carriers disengage carrying bars and retire quickly. The other two balks follow abreast and are laid in place.

8. Floor and pile carriers. (Sixteen men of second and sixth sections. Tools :-Carrying bars.

As soon as the balks of a bay are laid and lashed the flooring is laid to the middle of the bay and as soon as the planks are laid on a new frame the flooring is advanced to a point one inch from the cap.

When floors are called for, the floor carriers take from the pile, each, one pole or plank in right hand near the balance, front end raised, rear end trailing, and advance in single file keeping to the right to the head of the bridge, where they swing the pole to the left and pass it to the floor layers, then retire quickly keeping to the right, and bring another pole if needed. When poles are used they must be carried alternately butts and tops foremost in order to lie heads and tails in the bridge. Each carrier will therefore note how his predecessor carries the pole and will reverse his own.

As pile carriers, this section is divided into four parties of four men each. As soon as a frame is lowered into place two piles will be called for. The first and second parties with carrying bars (see Balk Carriers) advance with two piles (second and fourth,) abreast, pointed ends foremost, and lay them over the second and fourth drift bolt holes of the cap. Disengage the bars and launch the piles forward to balance on cap. The front carriers pass the lashings which they find on the cap over the pile then down and out around the cap. One holds the lashing while the other controls the pile. When the lashing is ready the rear carriers launch the pile forward again and let go. It will now over balance and swing to a vertical position under control of front carrier and lasher. When it is vertical, slack the lashing and let it drop to bottom. Adjust if necessary, and then fasten firmly to cap with square lashing. The carriers retire until the mauls have driven these two piles, when the third, fourth and first parties, advance with three piles, the first, third and fifth, which are set in place in like manner as the second and fourth, except that the middle one (the third) goes first and when it is dropped the first and fifth are set. For the next pile bent the second and third parties carry the first two piles and the fourth, first and second parties carry the three piles and so on by roster.

9. Floor layers. (Two men of seventh section.)

When flooring is called for, take station near last of flooring, one standing on first and second balks and the other on fourth and fifth balks, facing shore. Take poles 'or planks from the floor carriers, lay them on the balks and jam them hard against the preceding piece keeping the upstream ends even.

10. Maul Section. (Five men Third Section.) Tools:- Five mauls.

When the first two piles of a bent are set and lashed, two maul-men drive them. The backstays are slacked off so that the weight of the frame and men assists in sinking the piles. When the three piles are set and the frame raised and lashed, the other three maul-men drive them, assisted by weight of frame and men.

11. Saw Section. (Five men, third section.) Tools:— Two measuring rods cut to height of piles above water; one straight edge fifteen feet; two hammers; nails 10d; five hand-saws.

When piles are driven the frame will be lowered by backstays to a height convenient for working on tops of piles. The saw section will then re-adjust lashings to hold piles in place and support weight. Numbers one and five with measuring rods mark height on first and fifth piles, and tack on the straight edge at this height. Saw the five piles at the height thus determined; knock off the straight edge and retire.

12. Augers and sledges. (Five ' men, seventh section.) Tools :-Five augers; five sledges; three-quarter inch drift bolts, twelve inches long.

As soon as piles are sawed off, bore centrally in top of each pile a hole six inches deep. Take off the lashings. The frame will then be raised and advanced to final position, by back and fore stays. Drive five twelve inch drift bolts through caps into piles.

13. Trestle braces and boat crew. (Five men, seventh section.) Material:—One ponton with oars, boat hooks, painters, and lashings; braces three and a half inches by fifteen feet, two hand axes, one sledge, spikes six inches, one sounding rod, fifteen feet, marked to feet.

As soon as the position of one bent is determined, take soundings for next bent, twelve feet six inches from last bent and give soundings to pile section. As soon as a bent is completed by drift-bolting, spike on two diagonal braces, from water surface to cap on one side and from cap to water on the other. Trim the piles and flatten the braces to a good bearing and use two spikes in outer piles and one spike in interior piles.

Very Respectfully,  
THOS. H. REES,  
Captain Corps of Engineers, U. S. Army.

APPENDIX, D.  
*DEPARTMENT OF LAW.*

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General Service Staff and College,  
Fort Leavenworth, Kansas,  
June 30, 1903.

*The Secretary,*  
*General Service and Staff College*  
*Fort Leavenworth, Kansas.*

SIR:—

I have the honor to submit the following report on the workings of my department during the college year just closed.

By resolution of the college Staff a period of eighty half days was assigned to the subject of law, this subject including military and international law, as also administration, and although in my opinion the time allotted was by no means sufficient, the course has been covered in a very satisfactory manner and the results obtained are considered excellent. As regards the great majority of the students, great interest has been displayed in the work; this interest not being confined to the immediate course, but, as shown by frequent and pertinent questions on matter foreign to the text, extending to matters bearing upon the subject. If, as recommended by the college Staff in its late report, administration be omitted from the course for the next year, the good results obtained in this department may, I believe, be greatly increased.

Very respectfully,  
H. M. ANDREWS,  
-Major, Artillery Corps  
Instructor.

APPENDIX E.  
*DEPARTMENT OF MILITARY HYGIENE.*

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Post Hospital,  
Fort Leavenworth, Kansas,  
July 8th, 1903.

*The Secretary,*  
*General Service and Staff College,*  
*Fort Leavenworth, Kansas.*

SIR:

In compliance with paragraph 63, College Regulations, I have the honor to submit the following recommendations regarding the Course in Military Sanitation and Hygiene at the General Service and Staff College:

Recent practical experience in war has brought to the attention of the people, and incidentally to the Army, the fact that three times as many soldiers die of disease as of wounds, and that the most formidable enemy we have to contend with is the invisible one made up of *controllable* diseases.

I say "controllable" advisedly, for when, in the war of 1898 our camps had been given over to typhoid fever, the people arose in their wrath and demanded that this enemy be driven out, it was; but not until after 2565 men had died of disease, against 345 killed in battle. The Army had devoted its attention to the 345, and forgot the 2565.

We are not singular in this respect; the history of every active army, save one, is the same, the remarkable exception being the German, of which in the war of 1870, 33 per 1000 fell in battle and but 1.8 died of disease. This nation learned its lesson four years before, in the war of 1866 with the Austrians, which lasted but six weeks, and in which 6427 Germans died of disease, against 4450 of wounds.

Based upon recent military experiences, our very-practical people realized that in at least one direction the education of our officers was woefully lacking, i. e., the preservation of the health of soldiers, and hence it is that military hygiene has been more or less grudgingly admitted to the curricula of two of our military schools—admitted not because the Army, but the people, demanded it.

**That** no great importance was attached to the course in this institution is shown by the fact that it **was** given the least weight in marks of any subject in the curriculum; that the program outlined in the regulations is insignificant to a degree; that the present instructor was not assigned to duty until several months after the session began, and that his work as instructor is simply an episode of his office as Surgeon of the largest post in the Army, the duties pertaining to which fully occupy his time and demand his entire attention.

In spite of this handicap, it will be observed from the accompanying schedule that a fair attempt has been made to dignify the course, and to teach the student officers that there really is something in the subject of military hygiene that military men should have knowledge of. I am happy to add that the examination indicates that real profit has been derived from the course—which justifies the hope that when the class of 1903, General Service and Staff College, reaches command rank, the crimes of 1898 will not be repeated.

The foregoing remarks are offered to emphasize the necessity for a considerable knowledge on the part of line officers of the best methods of preserving the health of soldiers—not by curing them when ill, for that is the work of the physician; but of preventing illness, which is the very essence of military hygiene. Every sick man in a command is a palpable proof that the commander has failed by so much in obtaining an ideal result, and not until this fact is borne home to the mind of the line officer will that result follow. As I have frequently remarked, the line and the medical staff must have a more intimate knowledge of their mutual duties before a perfect fighting machine can be evolved.

I purpose that the course in Military Hygiene in this institution be placed on the same plane with the most favored branch, and that the same length of time be allotted for instruction therein.

If this is done, it must be quite evident that the instructor should be permitted to devote most of his time and thought to his work in the College, and that his relations to the post, if any, should be simply that of a medical inspector—in a word, that of Chief Surgeon of an independent command.

The details of the proposed course will be found in any work on hygiene, and might be outlined as follows (Munson) :

1. The selection of the recruit.
2. The development of the recruit,
3. The march in campaign.
4. Water.
5. The ration.
6. Clothing and equipment.
7. Camp sites and camps.
8. Sanitary administration of camps.
9. Posts-barracks-quarters-hospitals,
10. Ventilation.
11. Heating and lighting.
12. Disposal of excreta, sewage and refuse.
13. Personal cleanliness of the soldier.
14. Military morbidity and mortality.
15. Diseases of the soldier.
16. Disinfection.
17. Habits of the soldier as affecting his efficiency.
18. Hygiene of hot and cold climates.
19. Hygiene of the troop-ship.
20. Disposal of the dead.
21. Sanitary inspection of the military establishment, etc., etc., etc.

From the foregoing it will be observed that military hygiene is the foundation science in a military education. What boots it if an officer knows all else of the science of war, if he knows not how to care for the individual elements of the fighting machine, so that the apparatus can be brought into the fight effectively? This is the chief business of the line officer. The medical officer is here to advise him and to take care of his failures, the sick; but if there are any sick, the line officer is responsible, and he should be taught to appreciate and meet that responsibility.

Respectfully submitted.

JOHN VAN R. HOFF,  
Lieut.-Col., Dep. Surg. Gen., U. S. A.  
Instructor in Military Hygiene ,

**APPENDIX TO REPORT OF INSTRUCTOR,  
DEPARTMENT OF MILITARY HYGIENE,**

**PROGRAMME OF COURSE IN MILITARY HYGIENE,  
1902-03.**

**(1903.)**

May	5.	Lecture . . . . .	General Consideration... ..	Lecture Hall
May	6.	Lecture . . . . .	Selection of Soldiers . . . . .	Lecture Hall
May	7.	Lecture . . . . .	Physical Training. . . . .	Lecture Hall
May	8.	Recitation. . . . .	Text book, p. 1-7. . . . .	Section Rooms
May	11.	Recitation., . . . . .	Text book, a. 7-20 . . . . .	Section Rooms
May	12.	Lecture . . . . .	Military Clothing . . . . .	Lecture Hall
May	13.	Recitation . . . . .	Text book, p. 21-28. . . . .	Section Rooms
May	14.	Recitation . . . . .	Text book, p. 28-26 . . . . .	Section Rooms
May	15.	Lecture . . . . .	Food * . . . . . a. . . . .	Lecture Hall
May	18.	Recitation. . . . .	Text book, p. 37-47 . . . . .	Section Rooms
May	19.	Recitation. . . . .	Text book, p. 47-60 . . . . .	Section Rooms
May	20.	Recitation . . . . .	Text book, p. 70-71 . . . . .	Section Rooms
May	21.	Lecture . . . . .	Habitations . . . . .	Lecture Hall
May	22.	Recitation . . . . .	Text book, p. 70 -80. . . . .	Section Rooms
May	25.	Recitation. . . . .	Text book, p. 80-95 . . . . .	Section Rooms
May	26.	Lecture. . . . .	Camps . . . . .	Lecture Hall
May	27.	Recitation . . . . .	Text book, p. 96-107 . . . . .	Section Rooms
May	28.	Lecture . . . . .	Disposal of Wastes . . . . .	Lecture Hall
May	29.	Recitation. . . . .	Text book, p. 108-119. . . . .	Section Rooms
June	1.	Lecture . . . . .	Water . . . . .	Lecture Hall
June	2.	Recitation. . . . .	Text book, p. 120-125 . . . . .	Section Rooms
June	3.	Recitation. . . . .	Text book, p. 125-139. . . . .	Section Rooms
June	4.	Lecture . . . . .	Controllable Diseases . . . . .	Lecture Hall
June	5.	Recitation. . . . .	Text book, p. 140-146 . . . . .	Section Rooms
June	8.	Recitation. . . . .	Text book, p. 147-171. . . . .	Section Rooms

**REGULATIONS.**

Lectures will be given and recitations heard between 11 a. m. and 12 m. on the dates and at the places above specified.

For lectures the entire class will assemble in the Lecture Hall.

For recitation the class will be divided into three sections as follows :

First Section-Beginning with Lieutenant Abbott and including Lieutenant Fitzpatrick, will report to Lieut. Colonel Hoff, D. S. G., in the Lecture Hall.

Second Section-Beginning with Lieutenant Folwell and including Lieut. Mitchell, will report to Captain Stone, A. S., in Section Room A.

Third Section-Beginning with Lieutenant Morison and including Lieut. Wilson, will report to Lieutenant Edwards, A. S., in Section Room B.

The text book for this course is "Woodhull's Military Hygiene?"

### *GENERAL SERVICE AND STAFF COLLEGE.*

FORT LEAVENWORTH, KANSAS,

APRIL 22nd, 1903,

Orders }  
No. 10 }

Commencing Tuesday May 5, 1903, the hours of recitation will be as follows:

Tactics-9 to 10 a. m.

Tactics-10 to 11 a. m.

Hygiene-11 a. m. to 12 m.

II. For instruction in the subject of Military Hygiene, only, the class of student officers is divided into three sections as follows :

#### FIRST SECTION.

- 2ndLieut. James E. Abbott, 12th Cavalry,
- 1st " Charles F. Andrews, 13th Infantry,
- 1st " William A. Austin, 4th Cavalry,
- 1st Lieut. Percy W. Arnold, 1st Cavalry,
- 1st " Leonard T. Baker, 1st Infantry,
- 1st " Walter T. Bates, 17th Infantry,
- 1st " George N. Bomford, 5th Infantry,
- 1st " Ewing E. Booth, 7th Cavalry,
- 1st " Herbert J. Brees, 12th Cavalry,
- 1st " Allan L. Briggs, 14th Infantry,
- 1st " Fred W. Bugbee, 25th Infantry,
- 1st " Fred Bury, 23rd Infantry,
- 2nd " James S. Butler, 1st Cavalry,
- 1st " William A. Cavanaugh, 20th Infantry,
- 1st " DeWitt W. Chamberlin, 2nd Infantry,
- 1st " Percy M. Cochran, 7th Infantry,
- 2nd " Edgar N. Coffey, 12th Cavalry,
- 1st " Patrick A. Connolly, 21st Infantry,
- 1st " Bryan Conrad, 15th Infantry,

- 2nd Lieut. George R. Crawford, 11th Infantry,
- 1st " Milo C. Corey, 30th Infantry,
- 1st " Thomas B. Crockett, 24th Infantry,
- 2nd " Eugene P. Crowne, 4th Infantry,
- 1st " Frank R. Curtis, 13th Infantry,
- 1st " Charles H. Danforth, 17th Infantry,
- 1st " Fred L. Davidson, 7th Infantry,
- 2nd " John A. Degen, 4th Cavalry,
- 2nd " Auswell E. Deitsch, 5th Infantry,
- 1st " John T. Dunn, 11th Infantry,
- 2nd " Henry M. Fales, 21st Infantry,
- 1st " Arthur M. Ferguson, 14th Infantry,
- 2nd " William C. Fitzpatrick, 7th Infantry,

SECOND SECTION.

- 1st Lieut. William B. Folwell, 1st Infantry,
- 2nd " Granville R. Fortescue, 4th Cavalry,
- 1st " Charles S. Frank, 17th Infantry,
- 1st " John W. French, 19th Infantry,
- 1st " William M. Goodale, 25th Infantry,
- 1st " William B. Graham, 8th Infantry,
- 1st " George M. Grimes, 20th Infantry,
- 1st " Robert E. Grinstead, 23rd Infantry,
- 1st " Charles S. Haight, 4th Cavalry,
- 1st " Thomas R. Harker, 15th Infantry,
- 1st " John P. Hasson, 5th Cavalry,
- 2nd " William A. Haycraft, 22nd Infantry,
- 1st " John E. Hemphill, 10th Cavalry,
- 2nd " Franklin P. Jackson, 29th Infantry,
- 2nd " Douglas H. Jacobs, 5th Cavalry,
- 2nd " Solomon L. Jeffers, 12th Cavalry,
- 1st " E. Alexis Jeunet, 1st Infantry
- 1st " Gordon Johnston, 15th Cavalry,
- 1st " Walter H. Johnson, 8th Infantry,
- 2nd " C. Rodman Jones, 1st Cavalry,
- 2nd " Morris M. Keek, 12th Infantry,
- 1st " John M. Kelso, Jr., 13th Infantry,
- 1st " Thomas M. Knox, 4th Cavalry,
- 1st Lieut. George E. Kumpe, 28th Infantry,
- 1st " Franklin S. Leisenring, 4th Infantry,
- 1st " DeWitt C. Lyles, 20th Infantry,
- 2nd " John F. McCarthy, 19th Infantry,
- 1st " Donald C. McClelland, 10th Infantry,?

- 1st Lieut. Frank T. McNarney, 6th Cavalry,  
1st " Frederick W. Mills, Jr., 7th Infantry,  
2nd " Harry D. Mitchell, 16th Infantry,

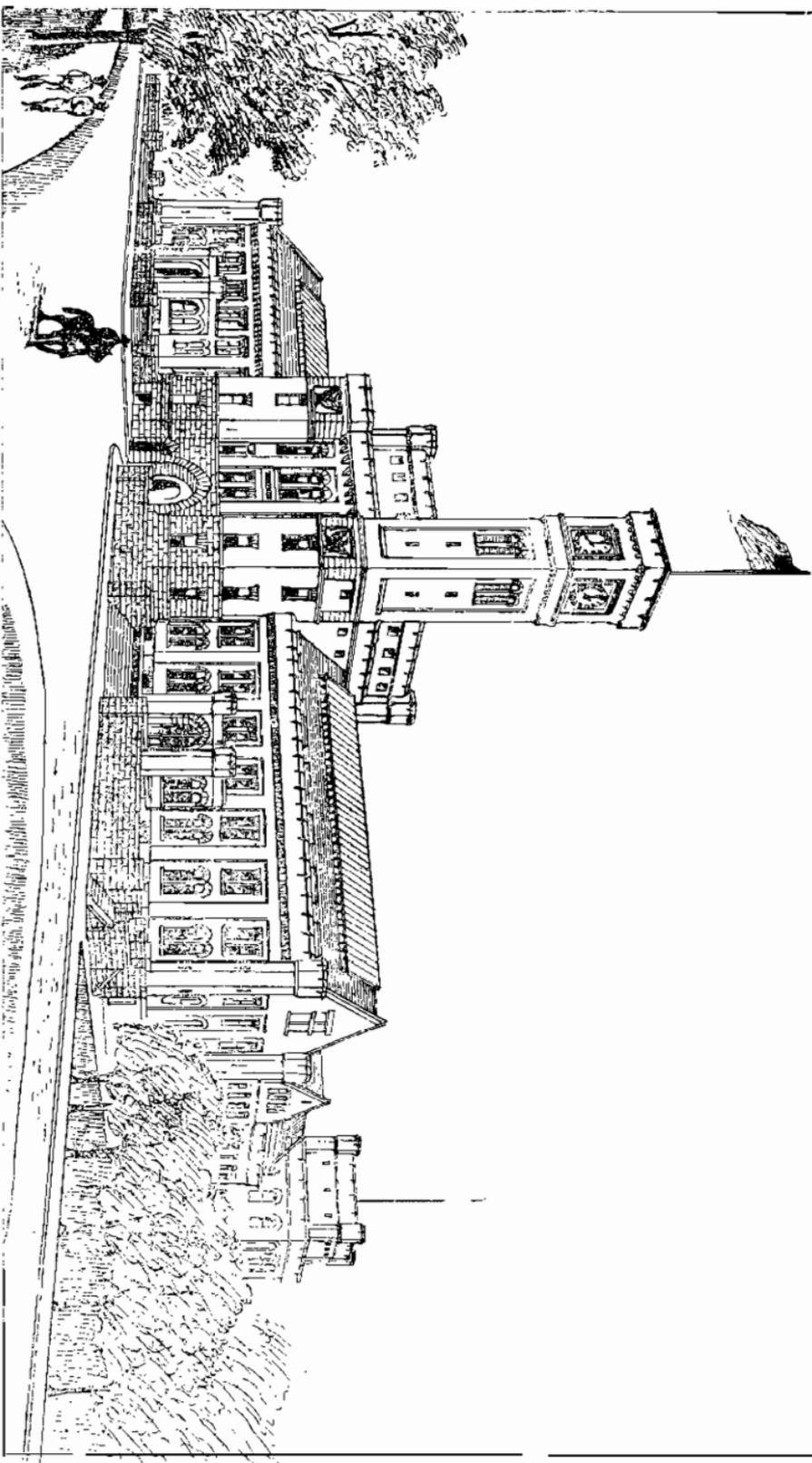
THIRD SECTION.

- 2nd " Charles R. W. Morison, 5th Infantry,  
2nd " John C. Murphy, 8th Infantry,  
1st " Benjamin P. Nicklin, 9th Infantry,  
1st " Englebert G. Ovenshine, 16th Infantry,  
1st " Ward B. Pershing, 4th Cavalry,  
1st " James M. Petty, 20th Infantry,  
2nd " Albert E. Phillips, 8th Cavalry,  
2nd " Arthur N. Pickel, 12th Cavalry,  
1st " Rowland S. Pike, 11th Infantry,  
1st " Joseph C. Righter Jr., 4th Cavalry,  
1st " Basil N. Rittenhouse, 11th Cavalry,  
1st " John B. Schoeffel, 9th Infantry,  
1st " Consuelo A. **Seoane**, 3rd Cavalry,  
1st " Rudolph E. Smyser, 14th Cavalry,  
1st " David A. Snyder, 6th Infantry,  
1st " Cromwell Stacey, 30th Infantry,  
1st " Jens E. Stedje, 4th Cavalry,  
1st " William R. Taylor, 3rd **Cavalry**,  
2nd " Henry S. Terrell, 8th Cavalry,  
1st Lieut. William M. True, 28th Infantry,  
1st " Alvin C. Voris, 8th Infantry,  
1st " Robert R. Wallach, 3rd Cavalry,  
1st " Rush S. Wells, 8th Cavalry,  
1st " Solomon B. West, 18th Infantry,  
1st " Kaolin L. Whitson, 9th Infantry,  
1st Lieut. Frank D. Wickham, 12th Infantry,  
1st " John F. Wilkinson, 6th Infantry,  
1st " Albert S. Williams, 5th Infantry,  
1st " George Williams, 8th Cavalry,  
1st " Gideon H. Williams, 28th Infantry,  
2nd " Joseph C. Wilson, 6th Infantry,

III. For recitations, the First Section will assemble in the Lecture Room, the Second Section in Section Room 'A' and the Third Section in Section Room 'B'.

By ORDER OF COLONEL MINER, Commandant:

L. M. Koehler,  
Captain, 4th Cavalry,  
Secretary.



PROPOSED NEW ACADEMIC BUILDING  
FOR INFANTRY AND CAVALRY SCHOOL, SIGNAL SCHOOL AND STAFF COLLEGE.

PAUL J. PEIZ, Washington D. C., Architect.