ANNUAL REPORT, 1910

THE ARMY SERVICE SCHOOLS

FORT LEAVENWORTH, KANSAS

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THE ARMY SERVICE SCHOOLS

FORT LEAVENWORTH, KANSAS

August 31, 1910.

The Adjutant General U. S. Army,
Washington, D. C.

Sir:

I have the honor to submit the following report of the operations and administration of The Army Service Schools for the year ending August 15, 1910.

The following is a list of officers who during the period covered by this report have been on duty at The Army Service Schools as commandant, assistant commandants, staff, instructors, and assistant instructors, The Army School of the Line, The Army Signal School and the Army Staff College.

Commandant

Brigadier General Frederick Funston, U. S. Army.

Personal Staff

Second Lieutenant Hornsby Evans, 19th Infantry, A.D.C.

Assistant Commandants

Major John F. Morrison, General Staff, The Army School of the Line and the Army Staff College

Major Edgar Russel, Signal Corps, The Army Signal School.

Secretary

Captain A. E. Saxton, 8th Cavalry.

Librarian

Lieutenant-Colonel Ezra B. Fuller, U. S. Army, retired.

DEPARTMENT OF MILITARY ART

Senior Instructor

Major John F. Morrison, General Staff.

Instructors

Captain T. 0. Murphy, 19th Infantry.
Captain Stephen M. Elliott, 11th Cavalry.
Captain D. E. Aultman, 5th Field Artillery.
Captain LeRoy Eltinge, 15th Cavalry.
Captain George F. Baltzell, 5th Infantry
Captain Matthew E. Hanna, 3d Cavalry.
Captain Stuart Heintzelman, 6th Cavalry.
Captain Arthur L. Conger, 29th Infantry.
Captain Roger S. Fitch, 2d Cavalry.
Veterinarian G. E. Griffin, 3d Field Artillery.

DEPARTMENT OF ENGINEERING

Senior Instructor

Captain J. A. Woodruff, Corps of Engineers.

Instructors

Captain Clarence 0. Sherrill, Corps of Engineers.
First Lieutenant G. C. Marshall,, Jr. ,24th Infantry.

DEPARTMENT OF LAW

Senior Instructor

Captain H. A. Smith, 7th Infantry.

Instructors

Captain C. E. Stodter, 9th Cavalry.
Captain Tenney Ross, 3d Infantry.
Captain Willey Howell, 6th Infantry.

DEPARTMENT OF LANGUAGES

Senior Instructor

Captain Arthur Thayer, 3d Cavalry.

Instructors

Captain James A. Moss, 24th Infantry.
Captain Dwight E. Aultman, 5th Field Artillery.
Captain H. W. Miller, 13th Infantry.
First Lieutenant Walter Krueger, 23d Infantry..

DEPARTMENT CARE OF TROOPS

Senior Ins true tor

Major Edward L. Munson, Medical 'Corps.

THE ARMY SIGNAL SCHOOL'

DEPARTMENT OF FIELD SIGNALING

Senior Instructor

Major Edgar Russel, Signal Corps.

Instructors

Captain A. C. Knowles, Signal Corps.
First Lieutenant J, A. Brockman, Signal Corps.

DEPARTMENT OF TOPOGRAPHY;

Senior Instructor

Captain J. A. Woodruff, Corps of Engineers.

DEPARTMENT OF LANGUAGES

Senior Instructor,

Captain Arthur Thayer, 3d Cavalry.

At the close of the year Captains Hanna, Conger, Stodter, Moss and Lieutenant Marshall were relieved on account of the expiration of the period for 'which they could under the law, be absent from their respective organizations. Captain Miller was relieved in order to enable him to enter The Army School of the Line Class the ensuing year. Captain Thayer was relieved at his own request.

The following officers have been detailed by War Department orders to take the places of those relieved: In the Department of Military Art, instructor, Captain Farrand Sayre, 8th Cavalry. In the Department of Engineering, instructor, First Lieutenant R. E. Beebe, 14th Infantry. In the Department of Law, 'instructor, E. K. Massee, 7th Infantry. In the Department of Languages, Senior Instructor, Major T. G. Hanson, 8th Infantry;, instructors; Captain William

Kelly, 'jr., 9th Cavalry and First Lieutenant C. F. Martin, 5th Cavalry. In The Army Signal School, instructors, Captain G. E. Mitchell, Signal Corps, First Lieutenant J. 0. Mauborgne, 3d Infantry and First Lieutenant E. K. Massee, 7th Infantry.

The following constituted the Staff Class for the year, all of them, with the exception of Captain L. T. Richardson, 22d Infantry, who was relieved on account of sickness, completing the course and graduating:

Major C. S. Farnsworth, 16th Infantry.
Captain Charles Gerhardt, 8th Infantry.
Captain Robert Alexander, 19th Infantry.
Captain N. F. McClure, 5th Cavalry.
Captain T. Q. Donaldson, jr., 8th Cavalry.
Captain F. M. Caldwell, '12th Cavalry.
Captain S. G. Jones, 11th Cavalry.
Captain J. McA. Palmer, 15th Infantry.
Captain P. B. Malone, 27th Infantry.
Captain J. W. Barker, Signal Corps.
Captain G. H. Davis, 12th Infantry.
Captain L. T. Richardson, 22d Infantry.
Captain R. H. McMaster, 1st Field Artillery.
Captain Manus McCloskey, 4th Field Artillery.
Captain E. D. Scott, 5th Field Artillery.
Captain H. V. Evans, 8th Infantry.
Captain C. S. Lincoln, 2d Infantry,
Captain Berkeley Enochs, 19th Infantry.
Captain A. W. Bjornstad, 28th Infantry.
Captain E. A. Sirmyer, 8th Cavalry.
Captain E. J. Williams, 5th Infantry.
Captain G. L. Townsend, 1st Infantry.

The following named officers constituted the Line Class at the beginning of the school year:

Captain Edward N. Jones, jr., 11th Infantry.
Captain James W. McAndrew, 2d Infantry.
Captain James B. Hughes, 4th Cavalry.
Captain Charles C. Clark, 27th Infantry.
Captain Palmer E. Pierce, 13th Infantry.
Captain Hansford L. Threlkeld, 30th Infantry.
Captain Lincoln F. Kilbourne, 26th Infantry.

Captain Oliver Edwards, 5th Infantry.
Captain William E. Welsh, 30th Infantry.
Captain Hugh D. Wise, 9th Infantry.
Captain Henry C. Clement, jr., 29th Infantry.
Captain Americus Mitchell, 5th Infantry.
Captain James A. Lynch, 28th Infantry.
Captain Frank A. Barton, 3d Cavalry.
Captain Edmund M. Leary, 11th Cavalry.
Captain Harold B. Fiske, 28th Infantry.
Captain Frank M. Savage, 15th Infantry.
Captain Edgar T. Collins, 6th Infantry.
Captain Robert McCleave, 2d Infantry.
Captain Stephen M. Kochersperger, 2d Cavalry.
Captain Joseph F. Janda, 1st Infantry.
Captain James H. Bradford, jr., 19th Infantry.
Captain Miles K. Taulbee, P. R. Reg. Infantry.
Captain Ralph S. Granger, 1st Field Artillery.
Captain Charles N. Murphy, 13th Infantry.
Captain John W. Barnes, 18th Infantry.
Captain Guy S. Norvell, 8th Cavalry.
Captain Laurence Halstead, 6th Infantry.
Captain Laurance Angel, P. R. Reg. Infantry.
Captain Louis T. Boiseau, 6th Field Artillery.
Captain Cleveland C, Lansing, 4th Field Artillery.
Captain James Justice, 19th Infantry.
Captain Wallace M. Craigie, 9th Cavalry.
Captain Henry A. Hanigan, 22d Infantry.
Captain John H. Poole, Corps of Engineers.
Captain Ernest D. Peek, Corps of Engineers.
Captain Theodore Schultz, 9th Cavalry.
Captain Arthur M. Shipp, 20th Infantry.
Captain Robert H. Wescott, 11th Infantry.

Of these Captain Clement was relieved at his own request, Captain Poole resigned from the army and Captain Craigie was relieved on account of being deficient in certain studies.

The remainder of the class graduated, as follows:

HONOR GRADUATES

Captain James W. McAndrew, 3d Infantry.
Captain Edgar T. Collins, 6th Infantry.
Captain Harold B. Fiske, 28th Infantry.

Captain Laurence Halstead, 6th Infantry.
Captain Palmer E. Pierce, 13th Infantry.

DISTINGUISHED GRADUATES

Captain Ernest D. Peek, Corps of Engineers.
Captain Hugh D. Wise, 9th Infantry.
Captain Robert McCleave, 2d Infantry.
Captain William E. Welsh, 30th Infantry.
Captain Oliver Edwards, 5th Infantry.
Captain James Justice, 19th Infantry,
Captain Laurance Angel, P. R. Reg. Infantry.
Captain Edmund M. Leary, 11th Cavalry..
Captain Stephen M. Kochersperger, 2d Cavalry.
Captain James H. Bradford, jr., 19th Infantry.
Captain Joseph F. Janda, 1st Infantry.,
Captain Louis T. Boiseau, 6th Field Artillery.
Captain Hansford L, Threlkeld, 30th Infantry.
Captain Frank A. Barton, 3d Cavalry.
Captain Guy S. Norvell, 8th Cavalry.
Captain Americus Mitchell, 5th Infantry.
Captain Charles C. Clark, 27th Infantry.
Captain Henry A. Hanigan, 22d Infantry.
Captain Frank M. Savage, 15th Infantry,.

GRADUATES

Captain Arthur M. Shipp,. 20th Infantry.
Captain James A. Lynch, 28th Infantry.
Captain L. F. Kilbourne, 26th Infantry.
Captain Cleveland C. Lansing, 4th Field Artillery.
Captain Robert H. Weseott, 11th Infantry.
Major Edward N. Jones, jr., 17th Infantry.
Captain Charles N. Murphy, 13th Infantry.
Captain Ralph S. Gpanger, 1st Field Artillery.
Captain -John W. Barnes, 18th Infantry.
Captain Miles K. Taulbee, P. R. Reg. Infantry,
Captain Theodore Schultz, 9th Cavalry.
Captain James B. Hughes, 4th Cavalry.

The following twenty-one were selected as the class to enter the Staff College for the next year:

Captain Laurance Angel, P. R. Reg. Infantry.
Captain Frank A. Barton, 3d Cavalry.
Captain' Louis T. Boiseau, 6th Field Artillery.
Captain James H. Bradford, jr., '19th. Infantry.

'Captain. Charles C. Clark, 27th Infantry.
Captain Edgar T. Collins, 6th Infantry. .
Captain Oliver Edwards, 5th Infantry.
'Captain Harold B. Fiske, 28th Infadtry.
Captain Laurence Halstead, 6th Infantry.
Captain Stephen M. Kochersperger, 2d Cavalry.
Captain Edmund M. Leary, 11th Cavalry.
Captain James W. McAndrew, 3d. Infantry.
Captain Robert' McCleave, 2d Infantry.
Captain Americus Mitchell, 5th Infantry.
Captain Guy S. Norvell, 8th Cavalry.
Captain Ernest D. Peek, Corps of Engineers.
Captain Palmer E. Pierce, 13th Infantry.
Captain Frank M. Savage, 25th Infantry.
Captain Hansford L. Threlkeld, 30th Infantry.
Captain. William E. Welsh, 30th Infantry.
Captain Hugh D. Wise; 9th Infantry.

Captains Hanigan, Janda' and Justice, who were by their standing eligible to enter the Staff College, chose. the Signal School instead.

The following list shows the names of those who entered the Signal School, all of them graduating with the exception of Captain Hepburn, who was retired on account of physical disability.

Captain Carl F. Hartmann, Signal- Corps.
Captain Charles B. Hepburn, Signal Corps.
Captain Henry W. Stamford, Signal Corps.
Captain Charles S. Wallace, Signal Corps.
Captain Walter L. Clarke, Signal Corps.
Captain George E. Mitchell, 13th Cavalry.
. First -Lieutenant Paul M. Goodrich, 9th Infantry.
. First, Lieutenant C. F. Leonard, 7th Infantry.
First Lieutenant J. A. Higgins, 25th Infantry.
First Lieutenant A. L. Singleton, 5th Infantry.
First' Lieutenant Robert Davis, 2d Field Artillery.
First Lievtenant W. E. Prosser, 3d Field Artillery.
First Lieutenant J. W. Riley, 6th Field Artillery.
First Lieutenant T. B. Esty, 14th Cavalry.
First Lieutenant J.. 0. Mauborgne, 3d Infantry.
First Lieutenant E. N. Bowman, 4th Infantry.

During the past year the various schools with

their respective departments, going to make up The Army Service Schools, have worked together absolutely without friction. A splendid spirit, worthy of the best tradition of the Army, has animated both instructors and students and has enabled every man to give the best there was in him. If this feeling can be maintained, it will constitute one of the greatest assets of the Schools.

Where an institution is running along as smoothly as this one and is doing such efficient work, it is best not to make radical changes,. but simply to carry out a policy of expansion by the addition from time to time of such new schools or departments as may seem expedient to the proper authorities, and to make such minor changes in the various courses as experience may show to be necessary. It should mean practically the same thing to be a graduate of the Staff College Class of 1910 as of 1915. During the coming year the policy of expansion will be carried out by the establishment of The Army Field Engineer School, and The Army Field Service School for Medical Officers.

The recommendation of Major Morrison that an additional school be established for the special training of quartermasters for the performance of their important duties in the field is approved, the course of instruction to be along the lines suggested by that officer in his report as senior instructor, Department of Military Art, Army Staff College, hereto attached.

In addition to the graduates of the School of the Line who might elect to take this course in lieu of entering either the Staff College or Signal School, it is thought that it might be well to detail each year about two majors or captains, especially selected from the permanent officers of the Quartermaster's Department, these nominations to be made by the Quartermaster General, as the Chief Signal Officer

now nominates each year certain officers of his corps to enter the Army Signal School.

It is to be hoped that the class entering the School of the Line in September, 1911, will be considerably larger than that detailed for the current year. As long as we keep the institution running at some expense it would seem best to get the most out of its facilities, especially as the addition of ten or fifteen officers would not either increase its running expenses or make necessary an additional. number of instructors.

The number of quarters available for officers on duty at the Schools is being increased from year to year, thus making it practicable to house more student officers., If desired by the War Department, report can be made at the appropriate,. time as to the maximum number that can be accommodated next year.

The improvements that are being made in the front of the college building and the approaches thereto are approaching completion, and will add greatly to the appearance of the structure and its surroundings.

The construction of a separate fire-proof building for our valuable library is an urgent necessity.

The relations between the post of Fort Leavenworth and the Service Schools have continued to be of the most cordial character. The Commanding Officer of the former, Colonel R. H. R. Loughborough, 13th Infantry, has complied to the best of his ability with all requests made of him, and has in every way given this institution the most loyal support.

The organization of The Army Service Schools Detachment, with its two divisions, one of white and one of colored men, has been an unqualified success, and in every way an improvement over the old system.

It is a pleasure to testify to the highly efficient

services of the Secretary of the Schools, Captain A. E. Saxton, 8th Cavalry, as: well as those of the force of civil service clerks working under his direction.

Very respectfully,.

FREDERICK FUNSTON,
Brigadier General, U. S. Army,
Commandant.

THE ARMY SERVICE SCHOOLS

FORT LEAVENWORTH, KANSAS

August **31,** *1910.*

THE COMMANDANT,

The Army Service Schools.

SIR:

I have the honor to submit the following report pertaining to the office of Secretary and Disbursing Officer for the fiscal year ending June 30, 1910:

I assumed the duties of the office on September 1, 1909, per paragraph 2, General Orders No. 17, dated The Army Service Schools, August 16, 1909, but had since July 19, 1909, on returning from the staff ride, acted as assistant to the Secretary, Captain E. E. Booth, 7th Cavalry, my predecessor.

During the period July 1, 1909, to June 30, 1910, the sum of $16,000 was allotted for the support of The Army Service Schools, of which amount $13,312.48 was expended as follows:

Furniture and stationery, offices and library.	$ 5,092.89
Dept. of Engineering, Photograph Dept., Drafting Room and Map Making Dept.. .	2,382.83
The Library (books and periodicals).	1,940.65
Bookbindery	698.58
Printing office	2,453.27
Army Signal School..	305.38
Rental of telephones..	174.40
Expressage	41.77
Transportation of persons and freight. ...	222.71
	$13,312.48
Not drawn from Treasurer U. S.	2,500.00
Deposited to credit Treasurer U. S. unexpended balance.. . , ...	187.52
	16,000.00

The organization of The Army Service Schools Detachments provided for in General Orders No. 118,

War Department, 1909, had been accomplished by my predecessor, Captain E. E. Booth, 7th Cavalry; under the direction of the Commandant, in a very satisfactory manner; These detachments have rendered excellent service and the year's experience fully justifies their organization. Composed as they are in great part of soldiers of long service, excellent results have been obtained as was expected. Each individual member has shown great interest in his particular work and has observed the motto of the schools for "team work." The Army Service Schools Detachment furnishes the personnel for the printing, book-binding, map-making, and office forces and for the care of the public and private animals, orderly duty, and other important work connected with the maintenance of The Army Service Schools.

The making and the reproduction of the various maps required, not only for use at The Army Service Schools, but for use at maneuvers, garrison schools, and to be sent out on the mailing list is a very important part of The Army Service Schools plant.

The system and dispatch with which this work was carried on reflects great credit both upon Captain Edwin T. Cole, 18th Infantry, and Captain James A. Woodruff, Corps of Engineers, who, in addition to their duties as senior instructors of the. Department of Engineering, the former to October 10, 1909, and the latter since that date, have given it their personal supervision.

Great credit is due Master Signal Electrician Howry, foreman of the drafting room; Master Signal Electrician Shindler, foreman of the printing room; Master Signal Electrician Ponder, foreman of the bookbindery; Regimental Quartermaster Sergeant Janes, foreman of the lithographic room, and to those under them for the efficient manner in which they have carried out the work falling upon them.

Mr. J. W. Healey (Captain, U. S. V.), Chief Clerk, and Mr. E. N. Fesler, in charge of the Book Department, have carried on the year's work with their well known care, zeal, and unfailing courtesy to those with whom they have come in contact.

So well have my predecessors organized the routine of business falling upon the Secretary's office that little remained except to endeavor to maintain the high standard that had. been attained. by them.

The "Mailing List" feature of the schools, mentioned in last year's Annual Report, has been maintained with satisfactory results. Through the medium of the "Mailing List", it has been the constant effort to supply information and excite the interest of all officers in the modern methods of studying the profession of arms by the applicatory method as practiced at these schools.

It must be understood, however, that such matter as can be printed and placed'upon the mailing list represents but a small proportion of the instruction given. This is so because the policy of the schools is to make the whole course just as practical as it is possible to do.

Students are brought in direct contact with the instructors at conferences, lectures, tactical rides, map maneuvers, maneuvers with troops, terrain exercises, terrain exercises in field fortification, practical sketching, moot courts, oral tests, etc., exercises none of which can properly be conveyed in printed form. These are all exercises where the actual ground or the oral discussion plays a very important part in the instruction to be derived from the exercise.

In consequence the mailing list cannot be considered as a correspondence course, but rather as an example-a mere. taste of the instruction that is being given at the schools, and an incentive to those

in the military profession to enlarge their views by entering the schools themselves at some future time.

It is hoped and desired that every officer in the regular service will soon be enrolled upon the "Mailing List".

A. E. SAXTON,
Captain, 8th Cavalry,
Secretary.

THE ARMY SERVICE SCHOOLS LIBRARY

FORT LEAVENWORTH, KANSAS,

August **31,** *1910.*

THE SECRETARY,

The Army Service Schools.

SIR:

The following report regarding the Library of the Army Service Schools for the year ended June 30, 1910, is respectfully submitted.

There has been no change in the library as regards rooms, fixtures or furniture during the year except the addition of a section to the card index cabinet.

As has been reported time and again, there is a crying need for more room for the proper care of books on hand and being purchased than can be furnished under present conditions. As before reported there are now on hand cords of books and pamphlets packed away in boxes and corded in the map room on the floor that are not accessible and which are now practically useless on account of their inaccessibility.

Furthermore, this valuable collection of books which year by year becomes of more value to the Schools and which could never be replaced in full if destroyed or damaged by fire, is deserving of better accommodations.

It would seem unnecessary to again invite attention to the important necessity of a new, separate and fire-proof building for the library, but it is one of such vast importance to the Service Schools that it is believed to be now the most important question in connection with these schools for those in authority

to consider. Whenever this matter does again come up for consideration, the Librarian desires to submit views regarding the plans for a new library building which will, if approved, change in some respects those heretofore submitted and approved by the Library Committee and Commandant. These new ideas regarding our special requirements as to a library are the results of experience gained as a librarian, the study of various plans for libraries and consultation with those who are experts in this work,

Master Signal Electrician Harry Bell, is still the principal assistant in the library and his experience and knowledge of the library makes his services of increasing value each ye&r. The second assistant, Squadron Sergeant Major Karl Unthank, has rendered good services during the nearly a year that he has been at this work.

The annual inventory shows that there are now 20,450 volumes in the library in addition to the numerous pamplets and etc., that have been stored away and are uncatalogued.

List of Accesions for the Year Ending June 30,1910

Public Documents and School Publications	417
Translations from Military Information Division.	130
From Bindery (Service Magazines & Periodicals).	168
By Purchase	523
By Donation (1).	609
Total	1847

List of Donors

Adjutant General., State of New York	1
Alexander, Captain Robert, U. S. Army	3
Barton, Captain F. A., U.S. Army..	20
Cavalry Journal.	11
Eltinge, Captain LeRoy, U. S. Army	2
Hartmann, Captain C. F., U. S. Army	4
Hawkins, General J. P., U. S. Army.	1
Hoad, General C. M. G., Insp. Gen'l, Australian Forces	1
Library, U. S. Military Academy	21
Lombardi, Mr. L. U	1
McClure, Captain F. N., U. S. Army.,	1

McGee, Lieutenant H. H., U. S. Army	637
Missouri State Historical Society	1
Neil, Mr. Henry M.	2
Singleton, Lieutenant A. L., U. S. Army	1
Swift, Chaplain H., U. S. Army	1
Total	609

Other Data

Books loaned out during year	3,345
Amount expended for books and periodicals.	$1940 66

(1) In addition to books donated, 14 maps were received from Senator Francis E. Warren, of Wyoming, through Captain Robert Alexander, U. S. Army.

Very respectfully,
EZRA B. FULLER,
Lieutenant-Colonel, U. S. Army, retired,
Librarian.

THE ARMY SCHOOL OF THE LINE

DEPARTMENT OF MILITARY ART

Fort Leavenworth, Kansas, August 31, 1910.

THE SECRETARY,

The Army School of the Line.

SIR:

I have the honor to submit the following report of the work of this department for the year ending August 15, 1910.

For convenience in several ways the course was divided into parts as follows:

Troops in Campaign
Tactics-5 parts
Weapons and Munitions
Military History and Conduct of War
Hippology

These designations are by no means accurate and are for administrative convenience.

Under the classification Troops in Campaign the course was as follows:

Organization. -Under this heading was given a lecture on the general principles of military organization and conferences and lectures on the organiza- of our army as given in Field Service Regulations, the sanitary organizations and their use in camp and on the battlefield and lectures on the organization of foreign armies,

Field orders, marches, camps, supply, and Convoys. -The Field Service Regulations being the text'book.

Care of Troops-Under this heading instruction was given in camp and march sanitation. How to care for troops under various conditions of field service with special reference to food, water, clothing and general sanitation.

One lecture on ammunition supply.

This course was followed by practical problems to be solved by the class involving the principles brought out in the above course.

This course was followed by part of the course in Tactics.

The tactical course was divided into five parts.

Part 1 included a study of the parts of the Field Service Regulations referring to the subjeet, lectures and conferences.' Then followed a series of seven map problems, seven terrain exercises, two maneuvers with troops, three war games, and two tactical rides. All this practical work was with commands of a single arm and not exceeding a battalion or squadron in strength.

In these problems the student knew in advance the kind of problem he was to solve.

Part II. consisted of five map problems with forces equal to a regiment and was followed by three war games with corresponding forces. In this part the student did not know in advance the class of problem he would have to solve.

The time devoted to these elementary problems appears large considering the class of student officers now coming here.

But after four years here as an instructor I still believe it gives the best result to give much time to the elementary part. It is presented first by lectures and conferences, then by map problems, then by terrain exercises, then by war games, maneuvers with troops, and tactical rides. A foundation is thus laid for the proper study of tactics dealing with larger commands.

Part III. deals with the reenforced brigade. Griepenkerl's '' Letters on Applied Tactics '' is studied as a text, the class then solving ten corresponding map problems followed by three war game problems. The student knows in advance the class

of problems he is to solve and can look up authorities on the subject.

Part IV. is ten map problems dealing with the reenforced brigade but the student is not informed in advance of the class of problem he will be called upon to solve.

Part V. deals with the complete division. Buddecke's "Tactical Decisions and Orders" is studied as a text book and is followed by a series of ten map problems dealing with the complete division. This was followed by fifteen terrain exercises intended as a general review of the year's course, problems extending in scope from a patrol to a division.

Eight maneuvers with troops and eight tactical rides completed the year's course in tactics.

Early in the course alternating with the tactical work was taken the course in Weapons and Munitions. This consisted of lectures on cavalry weapons, auxiliary weapons, conferences on pamphlet prepared by Major Russel, Signal Corps, on the Signal Field Company, its equipment and use; Captain Spaulding's " Notes on Field Artillery " and Captain Eames' "The Rifle in War". These conferences were followed by practical problems and demonstrations based on the above,

Before one can intelligently study tactics he must understand the tools to be used, this course was intended to help the students to gain such understanding.

During the year the class studied " The Conduct of War". On the completion of the subject, instead of an examination, a practical problem was given involving as many of the principles laid down in the text as practicable. The student officers were marked on their solution of this problem. No question was asked that could be answered in the words of the book.

In the course in Military History, Steele's Lectures were used as a text supplemented by eight lectures on foreign wars. It was sought in this course to give the class an outline sketch of the Military History of our Civil War as a preparation for a more exhaustive study later, and to bring out as far as possible in the time available the general principles of strategy.

The examination in this subject, prepared by Captain, S. H. Elliott, consisted entirely of a statement on certain strategic principles and the requirement to state in what campaigns of the Civil War they were illustrated and how.

A short course was given in the preparation of tactical problems with very satisfactory results.

The course in Hippology consisted of six lectures and three half days devoted to practical demonstrations, by Veterinarian G. E. Griffin, 3d Field Artillery.

The subjects were as follows:

1. Types and breeds of native and American horses.
2. Conformation of the horse and system of purchase by the Quartermaster Department.
3. Examination for unsoundness.
4. Anatomy of the horse's foot and its treatment.
5. Horses teeth and digestive apparatus.
6. Veterinary epidemic diseases, their suppression and elimination.

The practical demonstrations were as follows:

1. Shoeing.
2. Selection of horses for purchase, examination for soundness.
3. Age as determined by the teeth.

There is no examination in this course. The course was very satisfactorily handled. While very limited when the nature of these schools is considered and the fact that all the student officers have had a course in Hippology in the Garrison School before coming here, it seems to be all that can be given to it.

All student officers are required to take an hour's

physical exercise each school day unless engaged in some outdoor work, as sketching, maneuver, etc.

Classes in riding are organized and all student officers may and some must take this form of exercise.

Last year this instruction was under the charge of Captain Douglas McCaskey, 1st Cavalry, a graduate of the Mounted Service School.

Captain McCaskey was a most efficient instructor and a large part of the student officers joined the classes. The improvement 'in horsemanship was marked.

I believe it will be apparent from the foregoing that the effort is to make the course practical, and that the class standing of the student officer is determine.d by his ability to apply the principles in a practical way to concrete cases rather than his ability to commit them to memory from a book.

There are no examinations in this department calling for mere statements of what a text book may contain.

There will be some minor changes in the course for the ensuing year.

This department is assigned two hundred and twelve half-days for next year, an increase of four. It is proposed to omit the five problems in part II. and by a rearrangement to gain two half-days in other parts of the course making eleven half-days available for new work.

This will be utilized as follows: six conferences in " Troop Leading " and five map problems in the same. Three lectures will be added on the "Psychology of War".

The course in this department is gradually growing, developing and improving, I believe. It is not yet satisfactory in my opinion, more should be added.

Relatively to its practical importance to **our** officers and the ground to be covered it has not, proportionately, its share of the time.

The course in Military History now in the department, I believe could be cut out, It is important that the student officer should know it, but I believe should learn it before coming here. Captain Steele's lectures are so clear and well written that a special instructor is not necessary for them. If these could be required in the Garrison School or Post Graduate course they could be omitted. here. Until this is done, or something equivalent, I do not recommend dropping them from the course. I do recommend their introduction into the Garrison School and omitting them here.

The classes are coming here, generally speaking, better and better prepared and I believe it will soon be advisable to reduce the time given to parts of the course,

The extra time is needed to extend the work with the Division and Troop Leading, and a short course in Historical Research similar to that in the Staff Class should be added. Also one in Military Geography. At least fifty half-days would be required for this work and could be gained as follows:-Twenty by omitting the present course in Military History, twenty from the other *departments and ten gained in this department.

The class started out with 38 members of whom 36 remained to complete the course. The class is one of high average merit. Their work in this department was most satisfactory. The spirit shown by this class, and other recent ones, their hard work and earnest effort, should certainly tend to make the careful observer optimistic.

It is regretted the class is so small. A larger class would not increase the number of instructors or

Cost of this institution except for the time of the additional student officers.

I renew my recommendations of last year that there be established here a special ten weeks' course for field officers and another for a class of from 10 to 15 National Guard officers. My reasons have been given in previous reports, and further experience and acquaintance with officers of the National Guard has strengthened my belief in the advisability of at least the second school.

While this reservation is not adapted for the garrisoning of many 'more organizations than those here, especially the infantry and cavalry should be at war strength.

For maneuvers on a large scale the student officers go elsewhere during the summer. To properly carry out our work here for a part of the year we need the 'organizations now stationed here and of reasonable strength. From the very nature of this garrison the guard, extra and special duty details must be very heavy, leaving available in a company of 60 men but very few. It is not additional organizations of infantry and cavalry that are needed here but that these be of reasonable strength. The details away for various duties are practically the same regardless of size of company or troop.

The troops of the post were required for the two maneuvers in the fall and eight in the spring. These were furnished by the Post Commander, Colonel Loughborough, 13th Infantry, most cheerfully. -Owing to the depleted strength of the command to get out a reasonably sized command was possible only at considerable inconvenience, but he in every case sought to give me just what I wanted as far as possi ble.

The instructors in this department for the year were—

Captain T. O. Murphy, 19th Infantry
Captain S. H. Elliott, 11th Cavalry
Captain LeR. Eltinge, 15th Cavalry
Captain G. F. Baltzell, 5th Infantry
Captain M. E. Hanna, 3d Cavalry
Captain A. L. Conger, 29th Infantry
Captain Stuart Heintzelman, 6th Cavalry
Captain R. S. Fitch, 2d Cavalry

In addition Major E. L.' Munson, Senior Instructor, Department Care of Troops, in the Staff College, gave the instruction on all sanitary subjects. Captain D. E. Aultman, 5th Field Artillery, an instructor in the Department of Languages, assisted in this department and Veterinarian G. E. Griffin, 3d Field Artillery, conducted the course in Hippology,

Of these Captain M. E. Hanna, 3d Cavalry, left for other duty in May and Captain A. L. Conger, 29th Infantry, was relieved at the close of the school year.

Captain Farrand Sayre, 8th Cavalry, has been ordered here for the ensuing year.

This will reduce the number of instructors in the department by one.

The work of all the instructors was excellent. Their loyal support and earnest and able efforts are largely responsible for, what I believe to have been, the most successful school year since I have been here.

J. F. MORRISON,
Major, General Staff,
Senior Instructor.

THE ARMY SCHOOL OF THE LINE

DEPARTMENT OF ENGINEERING

Fort Leavenworth, Kansas, August 31, 1910.

THE SECRETARY,

The Army School of the Line.

SIR:

I have the honor to submit the following report of the work of this department for the school year 1909-10:

The 121 half-days allotted to this department were used as follows:

			Weight	Half Days
Military Topography Surveying	Theoretical	21 Conferences	00	23
		5 Partial Examinations	30	
		1 Final Examination	20	
	Practical		75	32
Military Topography Sketching	Theoretical-Conferences		00	4
	Practical Work		120	36
Field Fortification and Field Engineering	Theoretical-Conferences		00	7
	Practical	Map Problems	6	1
		Terrain Exercises	24	6
		Fortification Rides	00	2
		War Games	00	3
		Demonstrations	00	7
Total for year		Theoretical	50	275 121
		Practical	225	

The course in surveying was practically the same as last year, except that more time was devoted to plane table work and less to the transit and level. The plane table is now recognized as the best instrument for use in topographical surveys; and its use in accurate surveying is the best preparation for the rapid and approximate methods used in sketching.

Next year by dividing the class into parties of two officers each, instead of four as has been previously done, the same amount of instruction will be given in half the time. Two enlisted men will be assigned each party to act as rodmen. Twenty-three half-days instead of thirty-two have been assigned for this work and nine have been given the Military Art Department. Still more instruction will thus be given in plane table work.

There was a noticeable improvement in the work done in sketching. This was probably due to three factors, viz., better instruction by the Staff Class, an improved equipment, and a better text book on the subject.

Two new problems were introduced this year: A place sketch, and a reconnaissance of a position.

All the sketching work is now done with a hand plane table devised. by the department last year. This year it is equipped with a light metal tripod. This plane table has been issued to the Army by the Engineer Department, U. S. A., for trial.

Captain C. O. Sherrill prepared an excellent pamphlet on military sketching which was used this year and was found to be well fitted for the instruction of officers. It is to be embodied in his book on Military Topography, which will include map reading, surveying and sketching, and has been adopted as a text book for this department. This book contains only what is needed for the instruction of line officers in the subject and is the result of four years' experience in the instruction of captains in the department.

The course in field fortification was considerably improved this year by the introduction of a map problem, fortification rides, war games and an additional terrain exercise. The extra time was gained by giving the demonstrations in field fortification

and field engineering in half the time used last year without abridging their scope.

The department is indebted to Major C. A. F. Flagler, Corps of Engineers, and his officers for the interesting and instructive demonstrations in field fortification and field engineering.

Lieutenanant-Colonel J. E. Kuhn, Corps of Engineers, gave the class an excellent lecture on Field Fortification in the Russo-Japanese War, illustrated with numerous lantern slides.

The instruction of the class has been performed almost entirely by Captain C. 0. Sherrill, Corps of Engineers, and Lieutenant G. C. Marshall, 24th Infantry. They both are most excellent instructors and have spared no effort or time to make the course a success.

Since the relief of Captain E. T. Cole, 18th Infantry, I have been in charge of the reproduction of maps by mechanical, lithographic and photographic processes. The principal work has been in the preparation of strategic, topographic and war game maps from Gettysburg to Antietam.

A strategic map, scale 1 inch-l mile, with the timber areas and twenty-foot contours, covering an area of 17x26 miles around Gettysburg was lithographed. Eight of these will cover the terrain from Gettysburg to Antietam and Harper's Ferry.

Four topographic sheets, scale 3 inches=1 mile, were lithographed. These are reduced by photography from the war game map and each includes twenty war game sheets and covers an area $7\frac{1}{2}$x6 miles.

Tracings were completed of eighty-three war game sheets, scale 12 inches=1 mile, with five-foot contours. Each sheet is eighteen inches square. Forty-three of these were lithographed in colors. Copies of the remainder were made on black print

paper for the use of the Service Schools and War College. They will be lithographed next year.

The military details of this map were obtained by Master Signal Electrician John Howry, Army Service Schools Detachment, during July and August. On June 15th he was sent to Gettysburg with two draughtsmen to get the information for 120 additional sheets.

In addition to the Gettysburg-Antietam maps, thirty-six new sheets of the Fort Leavenworth War Game Map were completed, making fifty-six in all. The detail for these sheets was obtained by the Staff Class.

In the draughting department about 230 square yards of tracing were made; and 1,840 square yards of blue prints and 2,040 square yards of black prints were made.

In the photographic department the principal work has been the reduction and enlargement of maps; 400 lantern slides were also made. The principal improvement has 'been the introduction of the wet plate process which is used by all photo-lithographers, and is much cheaper and more efficient than the dry plate process.

In the lithographic department the principal improvements have been the introduction of color printing and the use of the shading machine. About 72,000 square inches of zinc plates were made during the year for maps and pamphlet illustrations.

The success of map reproduction this year is largely due to the organization and training of the force perfected by Captain E. T. Cole, 18th Infantry, who was in charge of the work until October 14, 1909.

J. A. WOODRUFF,
Captain, Corps of Engineers,
Senior Instructor.

THE ARMY SCHOOL OF THE LINE

DEPARTMENT OF LAW

Fort Leavenworth, Kansas, August 31, 1910.

THE SECRETARY,

The Army School of the Line.

SIR:

I have the honor to submit the following report of the work of this department for the school year ending August 31, 1910:

Allotment of time—

Elementary Law	16 half-days
Criminal Law	11 half-days
Law of Evidence	23 half-days
Moot Courts	6 half-days

A weight of 125 was assigned to this department and distributed as follows,:

Elementary Law	30
Criminal Law.....	20
Law of Evidence	20
Practical Exercises and Moot Courts ..	25

The list of lessons for the first three subjects mentioned above was the same as for last year. This list will remain practically the same for the ensuing year with the exception of some changes in subjects taught in Criminal Law. The text-books will remain the same.

An effort was made during the year to make the examinations practical. To this end in two of the four partial examinations in Elements of Law, and in all of the partial examinations in Criminal Law and the Law of Evidence students were permitted to consult their text-books. Thus 65 points out of 125 allotted to this department are covered by what are really practical exercises. Progress in this department lies in further extending this method.

The practical exercises and moot court exercises were this year printed and placed on the mailing list. They are therefore omitted from this report.

To show the character of the examination questions in the other subjects, I quote the following as fair samples of this year's work:

ELEMENTS OF LAW

The Act of May 11, 1908 (35 Stat., 109), provides:

"That hereafter any soldier honorably discharged at the termination of his first or any succeeding enlistment period, who re-enlists after the expiration of three months shall be regarded as in his second enlistment; that an enlistment shall not be regarded as complete until the soldier shall have made good any time lost during enlistment by unauthorized absences exceeding one day, but any soldier who receives an honorable discharge for the convenience of the government after having served more than half of his enlistment shall be considered as having served an enlistment period within the meaning of this act; * * * "

(a) Is the provision in the above act reading "but any soldier who receives an honorable discharge for the convenience of the government after having served more than half of his enlistment shall be considered as having served an enlistment period within the meaning of this act" prospective or retrospective, or both?

(b) State briefly the reasons for your decision.

Captain Allen at his own expense has improved the public quarters regularly assigned to him by nailing shelves to the walls of the room used by him as a study.

(a) Will the law permit Captain Allen to remove these shelves and take them with him when he vacates the quarters?

(b) State briefly the reasons for your decision.

Lieutenant Black loaned his gelding, a very quiet, well trained animal, to Lieutenant Griggs in order that the latter might train his mare to drive double by driving it with the former's horse. While Griggs was driving rapidly down a steep hill, both horses fell and were injured.

(a) Is Griggs legally liable to Black for the injuries to the latter's horse?

(b) State briefly the reasons for your decision.

From the evidence in the case of Hancock vs. Rand (94 N. Y. I), it appeared that the plaintiff and her husband, who

was an officer of the United States Army, having no permanent home, but living where military duty called him, occupied rooms in the defendant% hotel under an agreement made by the husband by which the family were to continue to occupy said rooms upon the terms specified until> the spring or summer following, providing everything was satisfactory and the husband was not ordered away on military duty. The family took their meals at the hotel restaurant, paying for each meal the same as other guests. While said rooms were so occupied by the plaintiff and her husband, jewelry of considerable value, belonging to the plaintiff, was stolen from said rooms, under circumstances which involved no negligence on the part of either the plaintiff or her husband. No notice limiting the liability of the inkeeper for loss or damage to valuables deposited in the office safe was posted in said rooms as prescribed by the Innkeepers' acts (c. 421, Laws 1835).

(a) Was the plaintiff legally entitled to recover the value of the stolen jewelry from the proprietor of the hotel?

(b) State briefly the reasons for your decision,

The following letter was received by Captain Oaks at Fort Leavenworth, Kansas, on September 29, 1909:

"KICKAPOO, **KANSAS,** *September 27, 1909.*

Captain J. A, **OAKS,** U. S. A.,

Fort Leavenworth, Kansas.

DEAR SIR:

I am very sorry that I was not around when you was here, but as to the gelding you was looking at, will say that it is a good, sound. animal and has five gaits under the saddle. *I* consider it safe for a lady to ride. My wife has ridden it frequently and it has been worked under harness on the farm. It is rising seven, about 15.2 and weighs about 1075. My price is $150.00 and I would like to sell it to you as I know it will receive good care. Please let me hear from you as soon as possible.

[Signed] B. J. JAMES."

To which Captain Oaks mailed the following reply:

"FORT LEAVENWORTH, KANSAS, *September 29, 1909.*

Mr. B. J. **JAMES,**

Kickapoo, Kansas.

DEAR SIR:

Your letter of the 27th instant just received. I was much pleased with the appearance of your gelding and if, as stated

in your letter, the horse is sound, capable of going five gaits, a safe horse for a lady to ride or drive! I will take it at $150.00, the price you name, providing you will deliver the horse to me not later than October 1st.

Very respectfully,

[Signed] J. A. OAKS,

Captain, 31st Infantry."

(a) Do the foregoing letters constitute a valid contract? (The question of contractual capacity of the parties need not be considered.)

(b) State briefly the reasons for your decision,

CRIMINAL LAW

Question 3, Final Examination, Evidence, 1908 : An officer is being court-martialed for duplication of pay accounts. The Judge-Advocate offers to introduce evidence that at or near the time of the commission of the alleged offense, the accused tried to borrow money from several different persons. This was objected to by the defense on the ground that it was totally irrelevant. Had you been a member of the court, what would have been your vote as to the admissibility of this evidence? Why?

Answer No. 30: "I would have voted to admit the testimony. * * * The gist of the offense charged is intent to defraud. * * * The evidence is admissible as tending to show intent or state of mind of the accused, such intent being a necessary part of the crime charged, hence material to the issue."

This testimony was clearly admissible. Are the reasons given by No. 30 correct?

The militia of the state of X (a state of the United States) assembled in a military manner with their arms and accoutrements at the state capital for the express purpose of resisting by force the execution of a law passed by the Congress of the United States, which law is deemed detrimental to the interests of the state,

Is this treason? Give reasons,

The Act of July 27, 1892, c. 273, S. 2, reads as follows:

"Whenever a court-martial shall sit in closed session, the Judge-Advocate shall withdraw, and when his legal advice, or his assistance in referring to recorded evidence is required, it shall be obtained in open court?

If Congress should repeal the above act and reestablish the former custom of permitting the Judge-Advocate to be

present during closed sessions of the court, would the repealing act be *ex* post *facto* as to offenses committed before date of repeal, but tried afterwards? Give reasons.

Private Mulrey, Company N, 31st Infantry, was tried by general court-martial "for attempting to: escape from the post guard house? The evidence showed that the sergeant of the guard, about 9 p.m., November 13th, saw a man walk by an open window in the guard house and pass something through the bars to Mulrey, who was at the window. He, the sergeant, at once made a search of the cell and found six (6) hack saws concealed under Private Mulrey's blanket. Mulrey was the sole occupant of the cell.

Give a summary of the argument you would make to the court were you counsel for Mulrey.

One evening in Manila Private A, Troop N, 16th Cavalry, met a smooth stranger and they had a few drinks together. The stranger said that he owed Gonzalez & Co. a small bill, but had nothing but gold with which to pay it, that gold was at a premium, but that Gonzalez & Co. would take it only at its face value, which would mean a loss to him. At the same time he displayed a number of twenty dollar gold pieces and said to Private A, "Let me have forty-one pesos for this twenty dollar gold piece, and I will pay Gonzalez. To-morrow I will get my gold changed and you may return the twenty if you wish." The stranger disappeared and the gold pieces turned out to be brass.

Was the stranger guilty of larceny? Give reasons.

Lieutenant X entered a street car at Fort Leavenworth and paid the fare. When near Metropolitan Avenue the conductor again asked for his fare, honestly believing that Lieutenant X had not paid it. Lieutenant X, refusing to pay again, the conductor forcibly ejected him from the car.

Was the conductor liable for criminal assault? Give reasons.

LAW OF EVIDENCE

Major Doe is on trial by general court-martial on charges alleging that while in command of a prison camp occupied by some 2,000 prisoners of war, he unnecessarily endangered the health of the prisoners by compelling them to live in unsanitary surroundings. The Judge-Advocate, after proving that Major Doe located and established the prison camp in question on low, marshy ground, infected with mosquitoes

and other insects, asked the court to take judicial notice that, as a general rule, the health of prisoners confined amid such surroundings is endangered.

(a) Should the court grant the request of the Judge-Advocate?

(b) State briefly the reasons for your answer to (a).

(c) Assuming that the court granted the request of the Judge-Advocate, has the defense a legal right to disprove the fact thus judicially noticed by introducing three prisoners of war to testify that they were confined in the camp in question without injury to their health?

(d) State briefly the reasons for your answer to (c).

Private Clan was tried by general court-martial on the following specification laid under the 62d Article of War:

"Specification.- In that Private T. J. Clan, Company A, 31st U. S. Infantry, having received a lawful order from Corporal A. B. Blank, Company B, 31st U. S. Infantry, said corporal being in execution of his duty, to halt, did wilfully disobey said order.

"This in Leavenworth, Kansas, at about 10:30 p.m., on October 19, 1909."

Clan, having pleaded "not guilty" and introduced evidence tending to show that he had not left the post on the night in question, the Judge-Advocate, in rebuttal, offered the testimony of Private Moore to the effect that he, Moore, had overheard a conversation at breakfast on October 20, 1909, between the accused and another soldier named Drury, and that, when, during this conversation, Drury remarked to Clan, "You look about all in, this morning. You must have had a peach of a time down town last night," the accused replied, "I sure have a head on me this morning, all right?

(a) Was this testimony of Moore's legally admissible in evidence?

(b) State briefly the reasons for your decision.

Sergeant Jones, Troop B, 16th Cavalry, is on trial for embezzling money entrusted to him by his troop commander for the purpose of paying the October, 1909, bills of his troop. One of the persons he was to pay was William Potts, a grocer. In his defense he wishes to introduce a witness to testify to a statement made by Potts on November 6, 1909, to the effect that the October account of Troop B, 16th Cavalry, has been paid. In offering this testimony, his counsel states that the defense is ready to prove that William Potts, the declarant, is now dead.

(a) Should the testimony as to Potts' statement have been admitted?

(b) State briefly the reasons for your decision,

In the Philippine Islands in 1899, Privates Charles P. Graham and James McCracken, Company H, 31st Infantry, engaged in a drunken altercation during which McCracken was shot in the stomach and fatally wounded. After being taken to the hospital, he was informed by the surgeon that the wound was fatal and that he could not recover. In response to the questions of the surgeon as to who had shot him and how it occurred, McCracken said: " Never you mind; I'll fool you yet about dying. Anyway, I aint dead yet? The next morning, although very low, he asked that Private Driscoll come to him, and, on Driscoll's arrival, said: " Jack, put your ear down close, I don't want anybody to hear me. I know I am all in, as the doctor said last night, but I aint going to say anything to let Graham in for trouble, but if they get after him for murder I want you to tell them how it happened. It wasn't really his fault. We was both drunk and when he kicked me I pulled my gun and while we was struggling for it it went off and I got it in the stomach. If I don't die you needn't say anything about it." McCracken died three hours later.

(a) If you had been a member of the court-martial that tried Graham for the murder of McCracken, in violation of the 68th Article of War, would you have voted to admit the testimony of Private Driscoll as to the statement of McCracken given above?

(b) State briefly the reason for your decision,

Lieutenant Boke is being tried by general court-martial for conduct unbecoming an officer and a gentleman, the specification alleging that he did assault and cruelly beat and otherwise ill treat his wife, Mrs. Helen Boke, to the scandal and disgrace of the military service. Mrs. Helen Boke, his wife, having been duly sworn as a witness for the prosecution, is asked concerning the alleged assault, whereupon the accused objects to her being used as a witness against him on the ground that a wife can testify against her husband only when he is being tried for personal violence against her and that he, the accused, in this case is not being tried for assault against his wife, but only for the military offense growing out of such violence.

(a) Should the court sustain the objection of the accused?

(b) State briefly the reasons for your decision.

On the trial of Corporal Benson by general court-martial for drunkenness on guard at Fort Dugan, Kansas, on January 4, 1910, in violation of the 38th Article of War, Sergeant Clancy, a witness for the prosecution, testified that he was sergeant of the guard at Fort Dugan on January 4, 1910; that the accused was a member of his guard and was constantly under his observation on the day in question, and that he, Clancy, saw no indication of any drinking or drunkenness on the part of Benson during that guard tour. The Judge-Advocate then addressed the court as follows: "The testimony of this witness greatly surprises me, as my investigation of the case led me to believe that his testimony would be materially different. I ask the court's consent to question this witness as to previous statement made to me and to the officers who originally investigated the charges against the accused with a view of bringing out the true facts in the case." To which the counsel for the accused replied: "May it please the court, Clancy was called by the prosecution and cannot be impeached by the Judge-Advocate. To allow the Judge-Advocate to question the witness as he desires would in effect be permitting him to endeavor to impeach his own witness."

(a) Had you been a member of the court, how would you have voted on the question thus presented?

(b) State briefly the reasons for your decision..

The conferences in Elements of Law and Law of, Evidence were conducted by Captain Tenney Ross, 3d Infantry. The practical exercises and moot courts were prepared by Captain Willey Howell, 6th Infantry. To these officers, I am indebted for their loyalty, efficiency and unceasing efforts to promote the welfare of the department.

Very respectfully,

H. A. SMITH,
Captain, 7th Infantry,
Senior Instructor,

THE ARMY SCHOOL OF THE LINE

DEPARTMENT OF LANGUAGES

Fort Leavenworth, Kansas, August 31, 1910.

THE SECRETARY,

The Army School of the Line.

SIR:

I have the honor to submit the following report of' the work of this department in Spanish in the School of the Line for the school year 1909-10:

ALLOTMENTS

Out of a total of 431 half-days, Spanish was allotted 45 half-days, beginning February 21 and ending June 1, 1910.

The weight assigned Spanish was 100, the same as last year and this was distributed among oral tests and one written examination the same as last year:

Four oral tests	60
Written examination	40
Total	100

The four oral tests were held on the 11th, 22d, 33d, and 44th class-room periods and were valued at 6, 12, 18, and 24 respectively. The written examination took place at the end of the course. No marks were given except on the oral tests and the written examination; and these were all held to be practical work. .

TEXT BOOKS

A course in Spanish (Department)
El Castellano Actual (Román y Salamero)

"A Course in Spanish" prepared in this department, is practically the consolidation in one book of the course as pursued last year in two text books. The arrangement of the book and its character are in

substance as set forth in my report of last year concerning the course then pursued. The first forty lessons of "A Course in Spanish" constituted the Line Class course, along with selected parts of "El Castellano Actual".

The course was supplemented by four illustrated lectures by Captain J. A. Moss, on Madrid, Bull Fighting, Madrid and El Escorial, and Granada and San Sebastian.

The instructors of the Line Class in Spanish were—

Captain J. A. Moss, 24th Infantry
Captain D. E. Aultman, 5th Field Artillery
Captain H. W. Miller, 13th Infantry
1st Lieutenant Walter Krueger, 23d Infantry

The class was divided into eight sections, the first four contained five students each, and the last four, four students each. The class-room periods were one hour and twenty-five minutes long, thus giving to the instructors about three hours of class-room work on days on which Spanish was scheduled.

The instructors changed sections at the end of every fifth lesson.

The division into sections was first made alphabetically, but after the first oral test, a rearrangement was made with a view to putting students of the same state of advancement in the same section.

The progress of this year's Line Class in Spanish was on the whole satisfactory; but as there were a number of students in the class who had previously given little or no attention' to the study or practice of Spanish, the ultimate progress of such, in the short course of forty-five lessons, can hardly be deemed sufficient to say thatthey have a working knowledge of the language.

The work of the instructors was highly satisfactory; their close attention to work, their ability, and

their patience produced as good results as could reasonably be expected.

The remarks in my last year's report concerning the necessity of student officers making an effort to acquire some knowledge of Spanish before entering the Line Class are as pertinent this year as they were last. A student can get but little more than a smattering of a language in forty-five lessons, no matter what his ability may be in the line of languages; and if he comes here without even an elementary knowledge of Spanish, he should not hope nor expect, after a short course of forty-five lessons, to be pronounced sufficiently fluent in Spanish to warrant his taking up a second language in his Staff Class year. Moreover the Line Class course in Spanish is sufficiently advanced and difficult to make it reasonably certain that any student officer, entering the class without previous study or practice of Spanish, will have rather a hard time to acquire sufficient knowledge to be declared proficient.

Very respectfully,

ARTHUR THAYER,
Captain, 3d Cavalry,
Senior Instructor.

THE ARMY STAFF COLLEGE

DEPARTMENT OF MILITARY ART

Fort Leavenworth, Kansas, August 31, 1910.

THE SECRETARY,
The Army Service Schools.

SIR:

I have the honor to submit the following report of the work of this department for the year ending August 31, 1910:

The instructors in this department for the year were:

Captain T. O. Murphy, 19th Infantry
Captain S. H. Elliott, 11th Cavalry
Captain LeR. Eltinge, 15th Cavalry
Captain G. F. Baltzell, 5th Infantry
Captain M. E. Hanna, 3d Cavalry
Captain A. L. Conger, 29th Infantry
Captain Stuart Meintzelman, 6th Cavalry
Captain R. S. Fitch, 2d Cavalry

Of these Captain M. E. Hanna, 3d Cavalry, left for other duty in May and Captain A. L. Conger, 29th Infantry, was relieved at the close of the school year.

Captain Farrand Sayre, 8th Cavalry, has been ordered here for the ensuing year.

This will reduce the number of instructors in the department by one.

The work of all the instructors was excellent. Their loyal support and earnest and able efforts are largely responsible for, what I believe to have been the most successful year since I have been here.

The class started with 22 members and graduated 21, Captain L. T. Richardson, 22d Infantry, having had to give up the course early in the year as the result of a serious surgical operation.

The average of the class was high, the work throughout by all members satisfactory. There was honest effort and hard work, an absence of friction, and a considerate treatment of myself and assistants that was largely responsible for whatever of success was attained and is highly appreciated and acknowledged.

The course for the year was but slightly different from that of the year preceding. It comprised:

Military History
Duties of the General Staff
Tactics
Staff Administration and Supply

The first two were the same as the year before and as previously reported.

The *Course in Tactics:* The class studied the book compiled here entitled "Selected Division Problems" and then solved a series of ten map problems.

Du Vernois' "Troop Leading" was studied and problems and war games in connection therewith.

Eight War Games and ten tactical rides were scheduled but all of the tactical rides were not had on account of the bad weather.

In addition to the above tactical work the Staff Class reviewed the solutions of twenty of the map problems of the Line Class and umpired most of the Line Class war games. Before umpiring the game for the Line Class they met the evening before and played the game with myself as umpire.

The course in Staff Administration and Supply was new and consisted of four conferences and eight problems. This course is one that it is hoped we can build up to a satisfactory point in a few years more.

Each member of the class was given a subject at the beginning of the year upon which he was to prepare a paper to be read before the class and by them discussed. The papers were excellent and amounted to a valuable course of lectures.

SUBJECTS FOR RESEARCH AND DISCUSSION

1. The Maxim silencer and its effects on future military operations.-Captain Evans,

2. The use and effect of flying machines on military operations,-- Captain Townsend.

3. The automatic rifle and the effect of its adoption on tactics--Captain Enochs.

4. Use of automobiles and motor cycles in field operations.--Captain Williams.

5. How can we amend the militia law to improve and strengthen this important branch of our service without unduly increasing the cost to the country?-Captain Palmer.

6. The role of cavalry in war.- Captain Sirmyer.

7. What should we do with our mounted orderlies?—Captain Farnsworth.

8. The infantry division and its composition. Captain McClure.

9. The normal attack of infantry as given in our drill regulations.—Captain Richardson.

10. Some of the important duties and problems that will confront the Chief of Staff of an infantry division of our army in the event of a great war and what he must know to properly fill his office.--Captain Scott.

11. The development of infantry organization and tactics.—Captain Lincoln.

12. A scheme of instruction for an infantry command.-Captain Gerhardt,

13. A scheme of instruction for a cavalry command.—Captain Donaldson.

14. Transportation of military commands by rail.—Captain Davis.

15. The railway systems of America considered with regard to a concentration of our forces to either seaboard.—Captain Barker.

16. The military geography of the Atlantic seaboard considered with reference to an invading force.-Captain Malone.

17. The military geography of the Pacific seaboard considered with reference to an invading force.-Captain Alexander.

18. The military geography of our northern frontier.—Captain McMaster.

19. The military geography of our southern frontier.—Captain Jones.

20. The importance of the service of the evacuation of

the sick and wounded by the Medical Department in time of war. --Captain McCloskey.

21. Maneuvers-large and small-how made most beneficial to the regular army and national guard.—Captain Caldwell.

22. How best to instruct the officers of our army in tactics.-Captain Bjornstad.

During the year by careful study and research the class prepared themselves for the Historical Ride from Chattanooga to Atlanta.

The class left here July 1st and proceeded to Chattanooga by rail.

After visiting the fields of Lookout Mountain and Missionary Ridge the class proceeded to Fort Oglethorpe where they were furnished with horses and a camp outfit. After the completion of the field of Chickamauga the class followed the movements of General Sherman's army to Atlanta.

The ride, I believe, was. very profitable to us all and well worth the cost to the government.

The proposed changes in the course for next year will be four more days allotted to Staff Administration and Supply, and the addition of a staff ride of one week's duration.

The time allotted to this department during the past year was 178 half days; for the ensuing year it is 175.

Heretofore a part of the Saturday forenoons have been used for school work, last year eighteen of them; this practice is now abolished; Saturdays will not be used next year.

In making the resulting deductions this department lost three half days less than its pro rata, due to other departments consenting to take more than their share of the loss.

More time is necessary if this department properly carries out the task assigned. The time allotted

to it is not in proportion to its importance and the wide field assigned to it.

If the change recommended in my report of the Line Class can be brought about, it will be a great help. The tactical work thus transferred from the Staff College year to the Line Class would be of great advantage to both classes.

The tactical work should be in the Line Class, and, if, so transferred, would render it possible to extend and improve the course in the Staff Class. The time even then would be inadequate and out of proportion to the other departments. More time should be-given to this department. For the present if we could get the part belonging to the Line Class transferred to it a most decided improvement could be made in this course.

The effort in this department of the Staff College is to make it more and more a preparation for higher staff duties in war. The Line Class work is more the tactical handling of troops and their care.

The two from their nature more or less overlap, but the governing idea is as above set forth. The field is a very large one and it is not claimed that it is covered. But something is being done, and, I believe, is better done each year. The course is improving, and I can see no reason why it should not continue to improve until a course entirely satisfactory is produced.

In our army the larger units do not exist, and of course their staffs are not organized.

On the outbreak of war these units must be formed and officers brought together to form the staffs -men who probably have not before worked together; men thoroughly competent and able, but not understanding each other--like an aggregation of excellent individual football players, each from a separate college, suddenly brought together to play

against a *team*. In a short time they may become a fine team, but at at the cost of earlier and sad defeats. No country can afford to leave this team-training for war until war comes. The best training for this team work is, of course, practice; to have the divisions complete in peace and the staff completely organized. While this is done abroad, it is impracticable in this country. Moreover, with newly formed divisions the necessity for a perfectly working staff increases and their difficulties will be much greater than with permanent units accustomed to working together.

It is not practicable in the short time available here to attempt to cover in the Staff Class all staff duties. Already we have a Signal School and Engineer School for the training of these two important members of the Division Staff. There is to be a course here for chief surgeons. With the Staff College course for the chiefs of staff of the divisions and the inspectors, there is lacking but one important branch requiring special training-the quartermaster. The importance of a competent chief quartermaster and that he understand the whole *game* and work in harmony with others of the staff cannot be overstated.

I therefore recommend the addition of another special course to the schools-one for the training of field quartermasters.

The students for the course to be taken from the graduates of the Line class in the same manner as now for the Staff College.

In order not to unduly increase the number of students here the class should not, for the present, exceed six or eight and the Staff class could be reduced from twenty-four to eighteen or twenty. Graduates of the Line class recommended by the

Academic Board to select which class they will join, Staff, Signal or Quartermaster.

The following is suggested as the outline of the course to be adopted for the Quartermaster School:

1. Duties of the General Staff. } Taken at the same time
   Administration and Supply, } and with the Staff class.
2. (cc) Logistics.-Especially the organization of the line of communication and the handling of the trains of an army. The class to take with the Staff class all they take of the subject and in addition a more extended course.
   (b) Mechanical traction in the field.
   (c) Movements by railroad and sea.
3. Law.--The law of contracts. Laws relative to seizure, impressment and requisition in war.
4. *History.* —One or more campaigns critically studied with special reference to the problems confronting the quartermaster.
5. *Geography.*—The commercial geography of this and adjacent countries.
6. *Veterinary.*—Classification of horses, sources of supply, purchase and inspection. Training and conservation of green animals. Animals endurance in saddle, draft, and pack. Vehicles, traction, and packing. Forage and feeding. Shoeing. Transportation of animals by rail and at sea. Organization and management of horse depots. Veterinary hygiene. Contagious and tropical diseases.
7. Supplies furnished by the Quartermaster's Department in the field, their inspection, purchase and care. Returns and accountability.
8. *Language.*- Same course as the Staff Class.
9. Shelter of troops in the field, camp expedients, watar supply, disposal of garbage and excreta.

If this course is adopted it will not necessitate an increase in the number of instructors.

Instruction in mechanical traction including gasoline engines would be given by the Signal force, the remainder of subdivisions 1 and 2 by the Department of Military Art;. Subdivision 3 by the present Law Departmant, 4 and 5 by the instructor of History in the Staff College, 6 by the Veterinarian attached to the Staff College. If none of the instructors in the school have had sufficient experience as quartermaster to give the 'instruction under 7 one could probably

be obtained in the post for the little time necessary, or better, some. one sent here by the Quartermaster General for a few days each year.

Languages would be taken with the Staff class -9 with the Staff class in the Department Care of Troops.

About two thirds of the work would be taken with the Staff class. The remainder of the time the proposed class would specialize in the duties of a chief quartermaster of a division or corps under war conditions.

If deemed advisable to make it a school instead of a separate course in the Staff College, there still need be no increase of instructors. It would require but one man as Assistant Commandant and he could also give instruction in the Staff College and reduce the force of instructors, Department of Military Art by one.

This class would join with the Staff Class in the war games, larger problems, and staff rides in the capacity of chief quartermaster.

No additional building or equipment is necessary; there is room here now for this purpose. No additional administrative force is necessary.

As far as I can see there should be no additional cost to the government from this plan.

If believed advisable to omit languages from this proposed course the time thus gained, 90 half-days, could be used to still further extend the work relating exclusively to the Quartermaster's Department.

It is recommended that there be organized and stationed here one ambulance company and one field hospital complete.

No such organizations at present exist in our army as far as I can find out. Certainly somewhere these units should be available. I have no doubt but that they will soon be available somewhere. It is

hoped that when formed they may be stationed here as being as available for the Medical Department, probably, as any other station and necessary for our Staff College work.

The work of preparing suitable maps for the work here has progressed most satisfactorily during the past year.

The detachment that worked-in the field during the summer of 1909 accomplished a large amount of very satisfactory work and this summer are again in the field.

Under the able direction of Captain J. A. Woodruff, Corps of Engineers, Senior Instructor Department of Engineering, the field work has been worked up and plates made for printing the part so far ready and will be available for the ensuing year.

As completed we will have a large area at a scale of 1″= 1 mile for the larger problems, a smaller area at a scale of 3″=1 mile for smaller problems and 12″=1 mile for the war game.

The lack of these maps has been severely felt and has hampered the work here in the past. The portion so far completed will greatly relieve the situation for next year. This work should be continued for a few more years until an adequate area has been properly mapped.

Very respectfully,

J. F. MORRISON,
Major, General Staff, U.S. Army,
Senior Instructor.

THE ARMY STAFF COLLEGE

DEPARTMENT OFENGINEERING

Fort Leavenworth, Kansas, August 31, 1910.

THE SECRETARY,

The Army Service Schools.

SW:

I have the honor to submit the following report of the work of this department for the year ending June 30, 1910:

The 108 half-days assigned to the department were used as follows:

		Half-days.
Assisting in the instruction of the School of the Line in Surveying		5
Topographic Surveying		25
Map Reproduction		1
Field Fortification	Terrain Exercises	17
	Fortification Rides	8
	War Games	a
Military Sketching		16
Assisting in the instruction of the School of the Line in Sketching		20
Fortress Warfare	Map Problems	8
	Terrain Exercises	3
	War Games	3
	Total	108

In addition there were 10 lectures on the history and development of Field, Permanent and Sea Coast Fortifications. Six of these were given by Lieutenant Colonel J. E. Kuhn, Corps of Engineers, on the results of his observations as an observer in the Russo-Japanese War.

The course has been practically the same as last year, except for minor changes found desirable in military sketching, field fortification and fortress warfare.

Next year the course will be shortened 18 half-days by the omission of Surveying, on account of the improved course for the School of the Line. The extra time has been assigned to the Military Art Department.

I have personally conducted all the instruction of the class as the department had one less instructor than in previous years.

J. A. WOODRUFF,

Captain, Corps of Engineers,
Senior Instructor.

THE ARMY STAFF COLLEGE

DEPARTMENT OF LAW

Fort Leavenworth, Kansas, August 31, 1910.

THE SECRETARY,

The Army Staff College.

SIR:

I have the honor to submit the following report of the work of this department for the school year ending August 31, 1910:

The time allotted to this department was sixty-two half-days. This time was utilized as follows:

	Half-days
Course in Constitutional Law	22
Course in Military Government and Martial Law	24
Original Research	8
Reading and Discussion of papers	8

The textbooks were the same as used last year and no changes are recommended for next year.

Papers were prepared by officers of the Staff Class as follows:

1. Powers and Limitations of Military Governments over Commercial Franchises, Existent and Prospective.

Captains Alexander and Jones.

2. Legal Rights and Duties of Post Commanders with Relation to Civil Authorities in Time of Peace.

Captains Barker and Enochs.

3. Powers of the United States over the Press in Time of War.

Captain Caldwell and McMaster.

4. Legal Rights and Duties of Detachments of the United States Army while Engaged in the Police of Our National Parks,

Captains McClure and Donaldson.

5. A Short History of the Laws Governing the Organization of Our Regular Army.

Captains Lincoln and Evans.

6. Changes Suggested for Improvements in the. Procedure and Administration of Military Justice.

Captains Sirmyer and Malone.

7. Citzienship and Naturalization.

Captains Farnsworth and Scott.

8. Changes in the. Law and Regulations that would be Necessary in Order to Reorganize the Army of the United States on a Tactical Basis. (That is, to secure a divisional organization and administration.)

Captains Palmer and Davis.

9. The Status of the Soldier: How Acquired; Rights and Duties Pertaining Thereto; How Divested.

Captains McCloskey and Richardson.

10. The Employment of the Regular Army in Domestic Disturbances.

Captains Williams and Townsend.

11. Amenability of Persons in the Military Service of the United States to State Civil and Criminal Jurisdiction for Acts Done in the Line of Military Duty.

Captains Gerhardt and Rjornstad.

These papers were all excellent and it is hoped that many of them will be printed in the service journals.

In addition to this work a new feature was added to the course. Each member of the Staff Class prepared for the department a leading case on Military Law. These cases are prepared in a readable style giving a short statement or history of each case, the legal principles involved, and the decision of the court. They are now being published in pamphlet form and it is believed that they will prove of interest to the Army at large. The following is a list of the cases and by whom prepared:

Captain Alexander,	O'Reilly d'Camara v. Brooke,	209 u. s. 45. 142 Fed. 858
Captain Barker,	Pundt v. Pendleton,	167 Fed. 997.
Captain Bjornstad,	Drury v. Lewis,	200 u. s. I. 129 Fed. 823.
Captain Caldwell,	Swain v. U. S.,	165 U. S. 553.
Captain Davis,	Houston v. Moore,	5 Wheat. 1.

Captain Donaldson,	In re Fair,	100 Fed. 149.
Captain Enochs,	Ex parte Shaffer,	154 Fed. 921.
	Reid v. U. S.,	161 Fed. 469.
Captain Evans,	Blake v. U. S.,	103 U. S. 227.
Captain Farnsworth,	Carter v. McLaughry,	183 U. S. 365.
Captain Gerhardt,	In re Turner,	119 Fed. 231.
Captain Jones,	U. S. v. Lipsett,	156 Fed. 65.
Captain Lincoln,	Tarbles Case,	13 Wall. 397.
Captain McMaster,	In re Stubbs,	133 Fed. 1012.
	Hamilton v. McLaughry,	136 Fed. 445.
Captain McCloskey,	In re Grimley,	137 u. S. 147.
		38 Fed. 84.
	In re Morrisey,	137 u. s. 158.
	In re Davison,	21 Fed. 618.
Captain McClure,	U. S. v. Clark,	31 Fed. 710.
Captain Malone,	Grafton v U. S.,	206 U. S. 333.
Captain Palmer,	Martin v. Mott,	1% Wheat. 19.
Captain Scott,	Badeau v. U. S.,	130 U. S. 240.
Captain Sirmyer,	Carrington v U. S.,	208 u. s. 1.
Captain Townsend,	Kirkman v. McLaughry,	152 Fed. 255.
Captain Williams,	Runkle v. U. S.,	122 u. s. 543.

This feature of the work will be continued next year.

It is also proposed to introduce next year practical problems in Military Government. The develop-mentof the course lies along this line.

For whatever success the department may have achieved this year, credit is due Captain Charles E. Stodter, 9th Cavalry, who had entire charge of the Staff Class work. A more efficient, zealous, and loyal assistant could not be found. Captain Stodter has been relieved from duty in the department and First Lieutenant E. K. Massee, 7th Infantry, detailed in his place,

H. A. SMITH,
Captain 7th Infantry,
Senior Instructor.

THE ARMY STAFF COLLEGE:

DEPARTMENT OF LANGUAGES

Fort Leavenworth, Kansas, August 31, 1910.

THE SECRETARY,

The Army Staff College.

SIR:

I have the honor to submit the following report f the work of this department for the school year 909-10:

ALLOTMENT OF TIME

Ninety-three half-days were allotted to this de- artment; the courses began September 30, 1909, and nded February 17, 1910; this was an increase of wenty-nine half-days over last 'year's course.

In all of the courses of language study in the taff and Signal Classes, the same general methods re pursued as those used in the Line Class work. as little time as possible of the class-room period is iven up to grammatical explanations, these the tudents are expected to work out at home; most of he class- room period is devoted to practical work and articularly to conversation; during the middle and atter part of the courses, exercises in dictation are egularly given.

The daily lessons in each course will be found in he several Lists of Lessons.

Phonographs were issued to the classes for such se as they care to make of them.

COURSES OF STUDY

French, German and Spanish classes were formed from he Staff and Signal Classes.

ELECTIONOFLANGUAGES

Six officers of the Staff Class were required to ontinue the study of Spanish; of the others, six lected French and nine elected. German.

FRENCH

Instructor

Captain J. A. Moss, 24th Infantry,

The French Class was composed of Captains Alexander, Barker, Evans, Farnsworth, Jones and Malone. There were no admissions to this class from the Signal School. All of these officers had had previous instruction in French and all were therefore assigned to the advanced course in French.

TEXT BOOKS

Advanced Course.

French Pronunciation (De Peiffer)
Conversational Lessons (I. C. S.)
Le Petit Parisien (Kron)
Le Petit Soldat (Kron)
Third year in French (Syms)
French Verb (Castaréde)

The only change in the text books books from last years course was the addition of Syms' Third Year in French.

The Course was supplemented by interesting illustrated lectures by Captain Moss on Paris, Versailles, Fontainebleau and Waterloo. These lectures were open to the schools and to the post.

The progess of the French Class was very satisfactory; all of the students developed fair ability in French conversation and some acquired an ease of conversation that a little practice in a French community would develop into fluency.

GERMAN

Instructor

1st Lieutenant Walter Krueger, 23d Infantry.

The German class consisted of Captains Bjornstad, Caldwell, Enochs, McCloskey, McClure, Palmer, Scott, Sirmyer and Williams of the Staff Class and Captain Mitchell of the Signal School,

This class was divided into two sections; the 1st Section comprised Captains Bjornstad, Mitchell, Mc-

Closkey, Scott, and Sirmyer; the 2d Section Captains Saldwell, Enochs, McClure, Palmer and Williams.

The members of the 1st Section had had some previous instruction in German

TEXT BOOKS.

German Conversational Lessons (I. C. S.)
Pamphlets (Department)
Glück Auf (Müller and Wenckebach)
Ein Neues Worth (Von Hoppenstedt)

The course was similar to that of last year but was extended to fill up the entire time of 93 half-days

The members of the 1st Section developed some ease in conversation and all the members of the class were pleased to find at the end of the course that they were able to translate rather difficult German with considerable facility.

SPANISH

Instructor

Captain D. E. Aultman, 5th Field Artillery

The advanced class in Spanish was composed of Captains Davis, Donaldson, Gerhardt, Lincoln, McMaster and Townsend, of the Staff Class, and of Lieutenants Leonard and Riley of the Signal School.

TEXT BOOKS

Advanced Course

Elementary Course in Spanish (Department)
Spanish Grammar (Ramsey)
El Castellano Actual (Román y Salamero)
Memorandum del Oficial del Estado Mayor (D. Antonio Victory)

The progress of this class was very satisfactory. At the end of the course all members of the class had developed considerable facility in conversation in Spanish.

REMARKS ON STAFF CLASS WORK IN LANGUAGES

The addition of twenty-nine half-days to the Staff Class course in languages was productive of very good results; the lengthened course of ninety-

three lessons is long enough to carry students through something more than elementary courses.

It is safe to say that students of the Staff Class who take up German or French for the first time now have courses of study of sufficient length to really give them a good foundation in these languages; and those that have had previous study are advanced to a point only a little short of fluency.

The idea of having small sections was carried out as far as practicable. The French class was small and the advanced Spanish class was not too large, and, in both of the classes, the state of advancement of the students was almost the same; but the German class consisted of ten students, five of whom had previously had some German instruction. It was found early in the course that this class was too large and that the attempt to teach students who had had no German along with others who had had previous instruction was not productive of good results; the class was consequently divided into two sections, and better progress began to be made at once.

The progress made by the student officers of the advanced course in Spanish, and the evident interest in and appreciation of their progress made it more apparent this year than last year that the instruction of this advanced course in Spanish in the Staff Class year was a decided improvement.

The instructors for the Staff and Signal School Classes—

General Frederick Funston, (volunteer instructor in Spanish for the Signal School),
Captain J. A. Moss, 24th Infantry, in French
Captain D. E. Aultman, 5th Field Artillery, in Advanced Spanish
Captain H. W. Miller, 13th Infantry, in Spanish for the Signal School
1st Lieutenant Walter Krueger,, 23d Infantry, in German

performed their duties in the most satisfactory man-

ner; to ability of a high order and to a thorough knowledge of the languages they taught, they added their earnest, conscientious, and patient efforts to get the best results possible in their several courses.

The work of the department in the Signal School will be found in the report of that-school.

In addition to the class-room work, the instructors have been occupied during the year in making up a new course of study. The text book "A Course in Spanish" that was begun by the department last year was put through the college press during the fall and winter and came out in time to be used by the Line Class.

Lieutenant Krueger, during the year, prepared a tentative German course that will be substituted next year for the very unsatisfactory course that has been in use heretofore.

It is hoped that by the end of the next school year the department will have been able to arrange a new French course to take the place of the course now in use, which is not entirely satisfactory.

Very respectfully,

ARTHUR THAYER,
Captain, 3d Cavalry,
Senior Instructor.

THE ARMY SERVICE SCHOOLS

Fort Leavenworth, Kansas, August 31, 1910

THE SECRETARY,

The Army Service Schools:

SIR:

I have the honor to make the following report of the work of the Department Care of Troops, for the school year 1909-10.

THE ARMY SCHOOL OF THE LINE

As work in the above school is under the Depart, ment of Military Art, co-ordinating with the latter, i will be reported upon by the Senior Instructor in tha Department.

THE ARMY STAFF COLLEGE

This course consisted during the year of twenty lectures and one problem. It was necessarily planned with special reference to covering points on which the members of this class had not been instructed during their work as Line class men of the previou, year, as a result of the instructor not being able t report for duty until much of the period assigned t his subject had elapsed.

The course was comprehensive and, together wit! that given the Line class, was illustrated by about 60 lantern slides.

The action taken during the previous year by th instructor, in calling for written comments an criticisms from the class at the conclusion of th course with a view to its betterment, elicited replie which indicate that the character and scope of th work had been very satisfactory from the studen

officers' standpoint. With the. placing of the course on a systematized basis, and the allotment of greater time to the subject as a whole, as has been accomplished in the present year, even more satisfactory results should be anticipated in the future.

CORRESPONDENCE SCHOOL FOR MEDICAL OFFICECS

The establishment of this school, under General Orders No. 100, War Department, June 1, 1910, was a new departure in our army and a first step toward a share by the Medical Department in the educational tdvantages of this general institution.

It was intended to be, and has proven, the forerunner of a Field Service School for Medical Officers, he educational work in which, as laid down in General Orders No. 132, War Department, July 11, 1910, s to be done under actual personal attendance by the student officers participating.

The Correspondence School started with a class of 30 medical officers on the mailing list, each of whom has received a series of problems having to do vith various phases of sanitary organization and service in the field. Solutions of these problems are now being received for comment and correction.

It is planned that the work of The Field Service School for Medical Officers will hereafter practically furnish the material for the work of the Correspondence School, so that those not in actual attendance at he former may nevertheless keep more or less in ouch with the subjects studied and the general nature of the instruction given.

These two schools have been established largely as a result of numerous personal inquiries and requests for information. and assistance from this Department by medical officers, who found themselves confronted with examinations of a medico-military and technical nature and for the preparation for

which no assistance was officially provided. The es tablishment of these schools was therefore recom mended by the undersigned as meeting a very clearly demonstrated need.

The institution of these schools by the War De partment is a very progressive step which must prove of vast advantage to the Medical Department in facilitating the management of the sanitary service in war, and through its resulting greater usefulness cannot fail to prove of incalculable military and humanitarian value to the rest of the army.

Very respectfully

E. L. MUNSON,

Major, Medical Corps,

Senior Instructor, Dept. Care of Troops.

THE ARMY SIGNAL SCHOOL

OFFICE OF THE ASSISTANT COMMANDANT,

Fort Leavenworth. Kansas, August 31, 1910.

THE SECRETARY,

The Army Service Schools,

SIR:

I have the honor to submit the following report of the work of The Army Signal School for the school year ending this date:

The following instructors were regularly assigned to duty with the School by the proper authority:

Major Edgar Russel, Signal Corps, Senior Instructor Department of Signaling and Signal Engineering.

Captain Arthur Thayer, 3d Cavalry, Senior Instructor, Department of Languages.

Captain J. A. Woodruff, Corps of Engineers, Senior Instructor in Topography.

Captain A. C. Knowles, Signal Corps, Instructor Department of Signaling and Signal Engineering.

1st Lieutenant J. A. Brockman, Signal Corps, Instructor Department of Signaling and Signal Engineering.

Captain Willey Howell, 6th Infantry, by G.O. 25, Army Service Schools, September 7, 1909, was specially assigned as instructor in topography, and conducted the sketching course for this year's class.

STUDENT OFFICERS

The following student officers were graduated June 30, 1910:

Captain Carl. F. Hartmann, Signal Corps.

Captain Walter L. Clarke, Signal Corps.
Captain H. W. Stamford, Signal Corps.
Captain Chas. S. Wallace, Signal Corps.
Captain G. E. Mitchell, Signal Corps.
1st Lieut. I? M. Goodrich, 9th Infantry.
1st Lieut. C. F. Leonard, 7th Infantry.
1st Lieut. J. A. Higgins, 25th Infantry..
1st Lieut. Asa L. Singleton, 5th Infantry.
1st Lieut. Robert Davis 2d Field Artillery.
1st Lieut. Walter E. Prosser, 3d Field Artillery,
1st Lieut. J. W. Riley, 6th Field Artillery.
1st Lieut. T. B. Esty, 14th Cavalry.
1st Lieut. J. O. Mauborgne, 3d Infantry.
1st Lieu-t. E. N. Bowman, 4th Infantry.

Captain Charles B. Hepburn, Signal Corps, was relieved from duty with The Army Signal School on December 15, 1909, per Par. 4, Special Orders No, 288, War Department,. series 1909.

The following officers were ordered to report for instruction in a special course of The Army Signal School.

Captain Wm.. M. Cruikshank, Signal Corps, reported November 18, 1909, per Par. 1, Special Orders No. 262, series 1909, War Department.. Relieved from duty at The Army Signal School and assigned to the command of Company A, Signnl Corps, on March 19, 1910, per Special Orders No. 65, War Department., series 1910.

Captain S. B. Arnold, 1st Cavalry, reported on January 3, 1980, per letter of instructions War Department, Adjutant General's Office, December 14, 1909.

Captain R. J. Burt, Signal Corps, reported on March 22, 1910, per Par. 31, Special Orders No. 59, War Department, series 1910.

The following officers were on duty with Company A, Signal Corps:

Captain Arthur S. Cowan, Signal Corps, until March 19, 1910.

1st Lieutenant H. C. Tatum, Signal Corps, until June 7, 1910.

Captain Wm. M. Cruikshank, Signal Corps, since March 19, 1910.

THE OBJECT OF THE SCHOOL

As stated in previous years, the object of the school may be considered as three-fold:

1st. To give instruction to officers of the Signal Corps, or line officers who may be preparing for detail in the Signal Corps.

2nd. To disseminate throughout the Army an acquaintance of the proper utilization of the Signal Corps in establishing lines of information.

3d. To make research and practical experiments in appliances and methods which promise to be of service to the Signal Corps.

To fulfill the second of these objects it appears that the resources of the school should be utilized to the fullest possible extent in order to spread a knowledge of the utility of this new and important arm of the service through the line of the army.

In carrying out the third object named above, unless the school is fortunate enough to obtain officers who have advanced considerably in technical training before coming here, it is difficult, in the limited time assigned, to get any extensive practical results. Nevertheless, in the past some of the contributions that have been made have been of interest and importance to the Signal Corps.

DEPARTMENT OF SIGNALING

Theoretical and practical instruction was given in Military Signaling. with the following devices:

(a) The Field Telegraph.
(b) The Field Telephone.

(c) The Field Buzzer.
(d) Wireless Telegraphy.
(e) Visual Signaling.

Allotment of Time

Theoretical ..... 42 half -days
Practical..... 81 half-days

DEPARTMENT OF SIGNAL ENGINEERING

In this department, thorough instruction was given in the fundamental laws or principles underlying electrical engineering to the extent necessary to enable the student officers to gain a thorough knowledge of the electrical apparatus used by the Signal Corps.

Allotment of Time

Theoretical..... 42 half-days
Practical. ..... .104 half -days

The course included instruction in:

(a) Practical Electricity.
(b) Signal Corps Manuals.
(c) Alternating Current.
(d) Oil Engines.
(e) Fire Control Apparatus.
(f) Laboratory Work.
(g) Photography.
(h) Aeronautics.

METHOD OF INSTRUCTION

Theoretical:

The standard text-books which were used last year are as follows:

American Telegraphy & Encyclopedia of the Telegraph—Maver.
Elementary Manual of Radio-Telegraphy and Radio-Telephony—Fleming.
Lessons in Practical Electricity-Swoope.
Primary Batteries-I. C. S. Pamphlets.
Storage Batteries -I. C. S. Pamphlets,
Management of Military Telegraph Lines — Signal Corps Manual No. 2.
Electrical Instruments and Telephones of the U. S. Signal Corps-Signal Corps Manual No. 3.
Manual of Photography-Signal Corps Manual No. 5.
Visual Signaling-Signal Corps Manual No. 6.

Property and Disbursing Regulations of the U. S. Signal Corps-Signal Corps Manual No. 7.
Fire Control-Signal Corps Manual No. 8.
Principles of the Gas Engine-I. C. S, Pamphlets.
Carbureters-I. C. S. Pamphlets.
Electric Ignition Devices-I. C. S. Pamphlets.
Troubles and Remedies--I. C. S. Pamphlets.

The recitations have been largely in the nature of daily conferences, both on advance and review. In general, text-books were used for advance and review lessons. The review lessonswere about double the length of the advance, In the theoretical electrical course, in general, each two review lessons were followed by a lecture. In addition, it was customary to have written problems in the proportion of about one to each two review lessons.

It is thought from the past two years' experience that an increase in the written problems would be an advantage, and in the coming year in place of review, each two advance lessons in electricity will be followed by a written recitation

After carefully noting the results obtained by both the recitation and the conference methods in theoretical instruction, it is thought best to modify somewhat the conference method as prevailing in the past two years. In the conference method the burden of proof rests upon the instructor. When student officers have had considerable previous technical school training and are accustomed to class room discussion, the conference method on account of its securing results by the most direct means, is very satisfactory. When the officers have not had this training, and are not inclined to engage readily in the discussion, it is developed later in the test problems that many essential points are missed.

By a judicious employment of the test problems and questions during the discussion which will be introduced more freely the coming year, it is thought that the good features of the conference method may

be retained and any individual shortcoming can be quickly detected and righted.

In each lesson where experimental illustrations were desirable, they were usually given by the instructor during the recitation. The lectures delivered generally involved illustrations of a more intricate character and were illustrative of subject matter outside of the text&book.

A pamphlet on alternating currents was prepared by Captain A. C. Knowles, Signal Corps, and. used with great success in this year's course.

Captain A. C. Knowles, Signal Corps, conducted most of the theoretical instruction aside from the lectures. His previous experience had well fitted him for this task, and his work has been most thorough and satisfactory throughout.

Practical:

The practical instruction under. the departments of signaling and signal engineering have been taken up under the head of "Laboratory" and "Field Exercises."

In connection with these, separate mention should be made of the practical instruction in visual signaling, both in doors and out, and in telegraphy.

The laboratory work proper was taken up January 4th and covered a total of 90 half-days.

The general character and scope of the work in the laboratory may be stated as follows :

'The student officer is required to solve a number of elementary problems, these being for the purpose of fixing the basic principles in the mind of the student and familiarizing him with the use of electrical measuring instruments.

In connection with the laboratory problems, the students are allowed to consult any book and are encouraged to make copious notes on all related pheno-

mena observed, in addition to that required in the problem.

The rules in preparing his report appear in the appendix.

As soon as the elementary problems are completed, practical ones are given, requiring the student officer

1. To solve problems, a brief statement of which is given in the problem sheet, the instruments used and methods of solution being left to the discretion of the student.

2. To examine and make wiring diagrams of Signal Corps equipment, such as buzzers, telephones, switchboards, telegraph sets, etc.

3. To locate and repair faults on a telephone system, the faults being distributed in telephones, on line, arrester strap and in switchboard.

4. To locate grounds and opens in an aerial cable 5500 feet long.

5. To locate grounds and crosses (with and without resistance) from a terminal station on a telegraph line 28 miles long, with four stations.

6. To set up and operate a repeating and duplex system.

7. Being given the elements, to set up and operate the sending and receiving circuits of the wireless "Pack" set.

8. To operate different wireless sets, 1 K. W., 3 K. W. and Telefunken.

9. To operate and determine the brake horse power of an oil engine.

10. To determine the brake horse power and efficiency of an electric motor.

The following new problems were introduced during the year.

1. Measurement of inductance (comparison method.)

2. Measurement of inductance (absolute method.)

3 Measurement of candle power (photometer method.)

4. Verification of A. C. calculations.

The following new instruments were added to the equipment of the laboratory during the year:

4 Galvanometers, Paul,

which, with shunt boxes, constructed in the laboratory, were used as voltmeters, ammeters and in connection with slide wire bridges.

1 Megger, 50 volt, 5 megohm.

1 Static machine.

During the coming year a double current generator set will be installed, which promises to be especially valuable in the alternating current course.

An opaque projector, which will project pictures and small apparatus, in addition to lantern slides, has been purchased and promises to be a valuable addition to our technical assets.

In all of the practical problems the student is given no more assistance than evidently may be required, and he is placed largely in the same situation he would be if sent to some distant station and required to turn in a complete report on the matter involved in the problem. One hour a day is set aside for practical work in telegraphy in the laboratory. This practice, while not obligatory, is usually taken advantage of. The test for qualification is the ability to send and and receive at least ten words per minute. All officers qualified this year. For practice in quarters, telegraph sets were installed, four separate lines being maintained, the current being supplied from a storage battery in the laboratory.

Practical instruction in visual signaling was given in thelaboratory and in the field. The test for qualification was sending and receiving five words (five letters counting as one word) with flag, heliograph and lantern. All officers qualified.

Lieutenant J. A. Brockman, Signal Corps, was in charge of the laboratory and other practical work mentioned above. His devotion to the duties has been rewarded by a most satisfactory conclusion of this part of the year's work.

Field Exercises:

The scheme pursued was as follows:

A progressive problem embracing several special situations was prepared by the instructors of the Signal School. These special situations involved advances, defensive positions, attacks, outpost and retreats,

Company A, Signal Corps, on duty with the Service Schools, was organized into six sections, four wire and two wireless. Officers of the Signal School were assigned to these sections as follows: two to each section, one as chief and one as assistant. There were also assigned one officer acting as chief signal officer and another as his assistant. The details were changed for each succeeding special situation, the assistant in each case becoming the chief with a new assignment of assistant. By this scheme each officer of the class was furnished an opportunity to act in different capacities and to note the working out of the problem in whole or part.

The instructors and graduates of The Army School of the Line and Staff College on duty with the Signal School were generally assigned to such duties as required special knowledge of military art.

On the days appointed for the first field exercise, Company A, Signal Corps, was assembled at some designated place in the vicinity of Fort Leavenworth, assignment of officers made, and a copy of the general situation and 1st special situation, with the order of the commanding general of the division handed to the chief signal officer. The latter was required to give

his instructions for the actual carrying out of the orders given him. His subordinates having received general instructions were required to work out all the details pertaining to the task assigned them by the chief signal officer. Upon completion of the operations involved in the 1st special situation, sometimes requiring most of the day, the assistants became chiefs of their respective units and the second special situation was taken up.

After each special situation. was worked out, the officers of the class were called together and with the aid of a map a general discussion was held. It was at these discussions, following as they did the actual maneuver, that much valuable information was gleaned by those concerned; the actual maneuver being the practical test of originality and initiative on the part of the officers and a most valuable means of pointing out to them the limitations and capabilities of this arm of the service, and, also, demonstrating in a manner never to be acquired by theoretical instruction and reading alone, the practical and efficient control of lines of information which, properly managed, are invaluable, to the control of troops in the field. The discussions referred to are really a clearing house of opinions, criticisms, suggestions and recommendations, and believed to be almost as valuable in themselves as the actual maneuver, but only when preceded by such maneuver on the ground. The general im.provement noted in each succeeding situation clearly brought ou.t the im.portance of these discussions.

In connection with the field exercises, attention is again invited to the unquestionable value of courses in military art, and military topography. A course in. military art, if introduced in the curriculum of The Army Signal School, must of necessity be brief by reason of the multifarious subjects now covered by

the course, but much could be done in establishing fundamental principles. Both courses should be specially arranged with a view to their peculiar adaptability to the duties of a signal officer. The present course in military topography has been of pronounced value to the student officers of the Signal School.

It seems just as necessary that an officer responsible for the control of troops in the field should be as conversant with a military map as an officer of the line who would find himself most seriously handicapped without a similar familiarity with military topography. Important as military topography is to the signal officer, it is felt that a knowledge of military art is even of greater importance. The normal distribution of troops on the march, the order of battle, the recognized principles governing the establishment of an outpost, the general plan considered in preparation of defensive positions, etc., with a more than speaking acquaintance with the terms generally employed in the science of military art, if unknown to the signal officer, when in the field particularly, may considerably detract from his professional ability along technical lines. Many instances could be cited in support of the opinions expressed above.

It is, therefore, recommended that a short course in military art, to be prepared by the department of that designation, be introduced in the Signal School, having for its object the education of the signal officer in the fundamental principles of military art as have been taught at these schools, including estimating situations, preparation of orders, solution of map problems, war games, and field exercises, the latter to be in conjunction with the other schools.

The latter suggests itself as particularly adapted to the general policy of these schools, viz. the coordination of the different arms of the service and the uses, limitations, etc., of the auxiliary and staff departments in time of war.

It is considered most important that the line should be familiar with the arm upon which the control of troops in the field must depend.

COURSE IN MILITARY SKETCHING

The course in military sketching, for those not graduates of the School of the Line, is somewhat similar to that pursued by the School of the Line, although much abridged.

The theoretical part of this course consisted of:

1. A lecture on maps and map reading.
2. Problems in map reading.
3. A lecture on scales and the constructionof scales.
4. Problems in the construction of scales.
5. A lecture on sketching.
6. A sketch from a sand representation.

The practical part of the course of non-graduates of The Army School of the Line consisted of:

Three preliminary position sketches of a half -day each.

One preliminary outpost sketch of one-half day.

Two preliminary road sketches, dismounted, and two preliminary road sketches, mounted, of a half-day each.

One record road sketch, mounted, one record position sketch, and one record outpost sketch, a full day being allowed for each.

For the officers of this school who had graduated at The Army School of the Line, the course was entirely practical and consisted of four road sketches, mounted, of a full day each, one place sketch of a half day, three position sketches of a half-day each, and one rapid position sketch of a full day.

The balance of the time of the graduates was spent in assisting the instructor in supervising the preliminary work of the non-graduates, in which capacity they were very useful.

The work of the two sections of the class was carefully graded with the view of giving each mem-

ber all he could possibly do in the time allowed without giving him too much, so that all should acquire speed and at the same time accuracy to the highest possible degree. Each sketch was carefully compared with the most accurate available map of the terrain; and errors in distance, orientation, contouring, etc., noted thereon, An effort was made to do this and to return the sketches so corrected in time for the student to get the benefit of their previous errors before they went on the next sketch.

All the work done by the graduates of the School of the Line and the record work done by the non-graduates was without assistance or instruction, so that the student's knowledge of the principles that had been taught him might be thoroughly tested.

The non-graduates are somewhat at a disadvantage in the beginning by reason of the fact that they have not had the course in engineering and map making with accurate instruments, that is of such great assistance to the students of The Army School of the Line in their course in military sketching. This makes it difficult for them, in the very short time spent in trying to teach them the theory of this subject, for them to grasp the principles involved.

Notwithstanding this difficulty, the course is valuable and furnishes a first rate basis for future study and practice in this most valuable military accomplishment. It is also of great value in increasing the ability of the student officer to read contoured maps, this being a particularly necessary accomplishment for officers serving on the staff.

COURSE IN PHOTOGRAPHY

The short course in photography introduced in the fall has been **very** interesting to some of the officers, although its brevity has been such that it has not succeeded in awakening much interest in those who have no natural taste for it.

All of the officers have turned in acceptable negatives, and all have made prints from them, usually on the standard so-called gas-light papers. The theoretical instruction consisted of lectures given on the use of the lens, lens stops, the camera and its adjustments, and the handling of the dry plate, to the finished negative. Captain E. T. Cole, 18th Infantry, who had been relieved from duty as senior instructor in topography, volunteered to conduct this course, for which he was exceedingly well fitted on account of his thorough technical knowledge, experience, and interest in photography.

It is hoped in the coming year, to devote more time to instruction in hand camera work in the automatic production of film negatives and prints which modern methods permit. It is thought with some of the excellent light and portable cameras now in the possession of the Signal Corps, that more satisfactory work in the field can be obtained, than by calling upon officers to manage the larger cameras heretofore used.

COURSE IN LANGUAGE

The work of the Department of Languages in The Army Signal School is seriously handicapped by the short time available in this subject coupled with the fact that a large proportion of the student officers come here with little previous preparation. It is regretted that it is impracticable to notify officers of their selection long enough ahead so they may prepare better to take advantage of their brief course.

Captain Arthur Thayer, 3d Cavalry, Senior Instructor in this department, has again invited attention to this difficulty, but on account of the exigencies of the service it does not appear how selections for the Signal School could be made any sooner than heretofore.

THESES

The graduating theses presented this year have been of the usual high class, The work is superimposed upon the school work and it is eonsidered highly creditable that papers of the value which these have, can be prepared in the limited time assigned. Following is a list of theses prepared and read this year by the student officers of the Army Signal School.

'Signal Troops in Maneuver" by Captain C. F. Hartmann, Signal Corps.

"Signal Equipment and Detachments for Line Work" by Captain W. L. Clarke, Signal Corps.

"The Organization and Equipment of the Signal Corps for an Over-Sea Expedition for Service with a Field Army" by Captain H. W. Stamford, Signal Corps.

"Military Telegraph Codes" by Captain Charles S. Wallace, Signal Corps.

"Storage Batteries, Their Care and Use in Signal Corps Work" by Captain G. E. Mitchell, Signal Corps,

"Visual Signaling" by 1st Lieutenant P. M. Goodrich, 9th Infantry.

"The Automobile and Motorcycle for Use in the Military Service" by 1st Lieutenant C. F. Leonard, 7th Infantry,

"Method of Conducting a Modern Telegraph and Cable Office" by 1st Lieut. J. A. Higgins, 25th Infantry.

"The Relation of Signal Troops to the Line in the Field" by 1st Lieutenant Asa L. Singleton, 5th Infantry.

'Communication for Field Artillery Fire Control" by 1st Lieutenant Robert Davis, 2d Field Artillery.

"The Discussion of the War Balloon and Similar Craft, and the Best Methods of Attack by Artillery" by 1st Lieutenant W. E. Prosser, 3d Field Artillery.

"Field. Artillery Communications : In the Regiment?' by 1st Lieutenant J. W. Riley, 6th Field Artillery.

"The Proposed Organization, Equipment and Employment of Signal Corps Troops in some Assumed Over Sea Expeditionary Movement Involving a Field Army" by 1st Lieutenant T. B. Esty, 14th Cavalry.

"Experiments in Directive Wireless Telegraphy and Other Means for Securing Selectivity?? by 1st Lieutenant J. 0. Mauborgue, 3d Infantry.

"A Signal Company at Maneuvers" by 1st Lieutenant E. N. Bowman, 4th Infantry.

TECHNICAL CONFERENCES

These were instituted the first year of the School, beginning with a view to encourage discussion upon professional subjects among the student officers, Subsequently, all officers of the Signal Corps were invited to contribute to these discussions, and since that time the scope of the Technical Conference has rapidly enlarged.

Last year: not only were the minutes of the conference published and sent out on the mailing list as heretofore, but also such contributions as were considered of special interest. The enlargement of the mailing list by the addition of a great number of names of signal officers of the National Guard greatly increased the interest in this branch of the work.

It may be said that the great advance in this year's work has been increasing the interest in the Technical Conference, and the consequential great expansion of its field of usefulness.

Not only have a number of very interesting original papers been read by the student officers, but also translations and selected articles presented which were of the highest interest.

The publication of the proceedings and papers in very attractive form has been due to Captain A. E. Saxton, Secretary, and to the illustrations prepared by the process of photo-zincography under the direction of Captain J. A. Woodruff, Corps of Engineers.

From the subjoined list it will be noted, that not only did the officers of The Army Signal School contribute, but also a number of others.

PAPERS PRESENTED AT TECHNICAL CONFERENCES

Conference No. 1.

"Recent Improvements in the U. S. Signal Corps Field Wireless (Pack) Sets and Some of their Possible Applications" by Captain A. S. Cowan, Signal Corps.

Conference No. 2.

"Instruction of Signal Troops of the National Guard" by Captain H. B. Kirtland, Signal Corps, Ohio National Guard.

Conference No, 3.

"The Problems of Wireless Interference and Selectivity" by 1st Lieutenant J. 0. Mauborgne, 3d Infantry.

'Multiplex Telegraphy and Simultaneous. Telephony and Telegraphy with Signal Corps Buzzers" by Captain A. S. Cowan, Signal Corps.

"Report on the Test of Various Signal Corps Field Glasses" by 1st Lieutenants Singleton, Esty and Mauborgne.

Conference No. 4.

"A Reconnaissance by an Airship" translated from the German-and presented by Captain G. E. Mitchell, Signal Corps.

"The Adaptability of the Modern Motorcycle for Use in Signal Corps Work" by 1st Lieutenant C. F. Leonard, 7th Infantry.

Conference No. 5.

"Observations at the Exhibition of the Curtiss Biplane by Mr. Chas. K. Hamilton, at Overland Park, Kansas City, Mo." by Lieutenant A. L. Singleton, 5th Infantry.

"Engineer Troops in the Melilla Campaign," Translated from the Spanish and presented by 1st Lieutenant P. M. Goodrich, 9th Infantry.

Conference No. 6.

"War Ballons and Ordnance for Attacking Them" by 1st Lieutenaht Robert Davis, 2d Field Artillery.
Discussion of the above by 1st Lieutenant W. E. Prosser, 3d Field Artillery.

Conference No. 7.

"The War Airship as a Weapon." Translated from the German and presented by Captain C. F. Hartmann, Signal Corps.

"The Dirigible Balloon as a Target for Artillery" by 1st Lieutenant W. E. Prosser, 3d Field Artillery.

"Theory of a Differential Duplex" by Captain A. C. Knowles, Signal Corps.

Conference No. 8.

Comments on Lieutenant Prosser's paper by Captain Wm. M. Cruikshank, Signal Corps.

"Practical Telegraph Testing" by Captain Charles S. Wallace, Signal Corps.

Conference No, 9

"Cables and Cable Laying" by Captain H. W. Stamford, Signal Corps

Comments on paper read by Captain Clarke on "Edison Nickel-Iron Storage Battery,, by Captain G. E. Mitchell, Signal Corps.

Conference No. 10.

Report on the Aga Signal Light by a committee of The Army Signal School.

"Transmission of a Military Sketch by Telegraph" by 1st Lieutenant A. L. Singleton, 5th Infantry.

"Wireless Pack Sets,, by 1st Lieut H. C. Tatum, Signal Corps.

Conference No. II.

"Notes on the Use of the Telegraph and Telephone by the Japanese in the Russian-Japanese War" by 1st Lieutenant T. B. Esty, 14th Cavalry.

Discussion of the above by Captain R. J. Burt, Signal Corps.

Conference No. 12.

"Principles for Instruction in the Science of Fortification in the Pioneer and Transportation Servive and in Fortress Warfare." Translated and presented by Lieutenant-Colonel J. E. Kuhn, Corps of Engineers.

"Service of Communication in the Russo-Japanese War.,, Translation from the German; presented by Major E. Russel, Signal Corps,

As will be noted from the above list of subjects, a number of the original papers were records of special lines of investigation by student officers of The Army Signal School. This recording and publication of special work during the year appears to be a more satisfactory method than any heretofore addopted.

AERONAUTICS

Since it has not yet been possible to provide a balloon train for The Army Signal School at Fort Leavenworth, the instructors and student officers of the Signal School were sent to Fort Omaha, Nebraska, on May 10th, remaining until May 15th. The balloon material available for demonstration purposes was as follows:

Dirigible Balloon No. 1-20,000 cu. ft. capacity.

The German "Drachen" (captive) balloon, 30,000 cu. ft. capacity.
Two Spherical Balloons, capacity of 19,000 and 9,000 cu. ft. respectively.
One gasoline-driven balloon winch.

These balloons, in connection with the balloon house, gas generating plant and compressor plant, gave excellent facilities for demonstration in this important branch of Signal Corps work.

The dirigible balloon was first inflated and a short trip made with it, but its performance was not very satisfactory owing to the small size and insufficient power of its engines, combined with structural weakness in the machinery and framework. The "Drachen" balloon was put in the air, and in connection with the steam winch, a very good demonstration of the management of a captive balloon was given. The larger size spherical balloon was inflated and a short flight was made, Captain C. DeF. Chandler, Signal Corps, acting as pilot, and with Captain R. J. Burt, Signal Corps, and Lieutenant W. N. Haskell, Signal Corps, as passengers. The class, during the inflation of the balloon and all stages of the demonstrations took copious notes, and at the close of the visit submitted very satisfactory reports of their observations of the whole plant.

It has again been amply demonstrated th.at these visits are productive of great good to the student officers, and as long as there is no balloon train at Fort Leavenworth, these visits should be repeated each year.

The practical course in aeronautics at Fort Omaha was supplemented by two lectures by Captain C. DeF. Chandler, Signal Corps, as noted in the list of lectures delivered during the year.

COMPANY A, SIGNAL CORPS

The work of this excellent company has contin-

ued during the year to be one of the most valuable features of the school work. Under the command of Captain A. S. Cowan, Signal Corps, relieved March, 1910, and Captain Wm. M. Cruikshank, Signal Corps, who succeeded him, the administration of its affairs has been most satisfactory, and the excellent performance of its technical duties have been noteworthy.

This company is called upon, not only to attend to the multifarious duties which fall to the share of any field company, but it has also been directed in a great many eases to make experiments with material or apparatus sent from Washington for immediate test and report. Among other things, a great many field tests have been made with wireless telegraph apparatus, notably the Telefunken sets which were sent from Washington. These sets, consisting of a wagon set of $2\frac{1}{2}$ K. W. power and two smaller sets, each of $\frac{1}{4}$ K. W., have taxed the resources and ingenuity of the company. In addition' to this the pack wireless equipment of the Signal Corps has been revolutionized in the past year as a result of the experiments made in this company. Lieutenant H. C. Tatum, Signal Corps, assisted by a number of the expert enlisted assistants in the company, has been particularly active and efficient in this work, devising new methods of arranging and packing the parts of these sets. As a result' of this work, this country has as efficient and compact wireless equipment as can be found in the world.

During May and June this company has taken part in the field problems of the Signal Corps and has achieved marked success in demonstrating what can be done with such an organization in the field.

WIRELESS STATION

The wireless station which has been erected during the past year on Engineer Hill is now complete

and communications with a smilar station at Fort Omaha, one hundred and fifty miles distant has been established.

This station consists of a small, neat, brick building, in which the operating plant is installed, and a two hundred foot structural steel tower carrying the antenna or aerial wires. This tower was erected by Company K, Engineers, under the supervision of Captain L. V. Frazier, Corps of Engineers, and is an excellent piece of work.

In the station the power is given by a 3 K. W. motor-generator---phase motor, 120-cycle, single phase generator. This, in connection with a 110-20000 volt transformer and a plate glass condenser furnishes the high frequency power needed. The operating and receiving devices are all of the best construction and the station has been pronounced by experts who have examined.it, as an admirable piece of work.

While in one sense this station is an extension of the telegraphic facilities of the post, its primary object is for demonstration and instruction purposes.

CONCLUSION

Any report of the year's work that did not make acknowledgment of the cordial relations which have existed between The Army Signal School, the other schools, and the post, would not be complete. A spirit of the most generous compliance has been uniformly experienced in any request that has been made by this school. To show proper recognition0 f this the instructors and student officers of the Signal School have been constantly reminded that cheerful cooperation should be the leading principle in dealing with the other sehools and the post. This, as in the past, has produced the most pleasant and profitable results to all.

Very respectfully,

. E. RUSSEL,

Major, Signal Corps,

Assistant Commandant, Army Signal School.

APPENDIX

THE ARMY SIGNAL SCHOOL

List of Lectures given during the year

1909

SEPTEMBER

1st. Opening address to The Army Signal School by Major Russel.

7th. Lecture by Major Russel: "Light and Lenses."

NOVEMBER

3d. Lecture by Major Russel: "Magnetism."

DECEMBER

6th. Lecture by Major Russel: "Recent Advances in Aeronautics."

9th. Lecture by Major Russel: "The Electric Current."

14th. Lecture by Major Russel: "Electromagnets and Units."

17th. Lecture by Major Russel: "Electrical Instruments and Measurements."

22d. Lecture by Major Russel: "Units, Thermal Effect of Currents and Self Induction?

1910

JANUARY

21st. Lecture by Major Russel: "Static Electricity.

FEBRUARY

7th. Lecture by Major Russel: "Buzzers and Other Apparatus for Induction Telegraphy?

8th. Lecture by Major Russel: "Laying, Operating and Reparing Submarine Cables?

17th. Lecture by Major Russel: "Dynamos."

MARCH

1st. Lecture by Major Russel: "Dynamos and Motors."

4th. Lecture by Lieutenant Colonel Glassford, Signal Corps: "Aeronautics and War?

APRIL

22d. Lecture by Major Russel: "Alternating Currents?

29th. Lecture by Major Russel: "Wireless Telegraphy."

MAY

11th. Illustrated lecture by Captain DeF. Chandler, Signal Corps: "Balloons."

12th. Lecture by Captain C. DeF. Chandler, Signal Corps: "Theoretical Discussion of Aeronautics in General."

20th. Lecture by Mr. C. D. Haskins: "Electrical Engineering?

21st. Lecture by Mr. C. D. Haskins: "Appliances for Electrical Measurements?

30th. Lecture by Major C. McK. Saltzman, Signal Corps: '(Fire Control for Sea Coast Artillery?

31st. Lecture by Major C. McK. Saltzman, Signal Corps: "Maintenance of Seacoast Fire Control Installations and Field Artillery Fire Control.

Department of Field Signalling, The Army Signal School.

Visual Signalling-Problem No. 1, Time allowed, 2 hours.

1. Write the Myer alphabet and numerals.

2. Show everything that you would send in transmitting the following message by visual means;

Farley, Missouri,
September 6, 1909.

Commanding Officer,
Fort Leavenworth, Kansas.

Enemy's cavalry patrols seen in vicinity of Platte City, Mo., ten a.m. today.

DOE,
Lieut.

3. Describe the duties of each man at a visual signaling station equipped with both flag and heliograph assuming four men in the detachment.

4. (a) What is acetylene? (b) In what two ways is acetylene gas generated by the Signal Corps?

5. (a) Under what condition is searchlight signaling esp ecially valuable? (b) What two methods are employed in this class of signaling?

6. Describe one method of setting up a heliograph using two mirrors.

7. Give the advantages of the heliograph for visual signaling,

8. Describe what takes place at a repeating station in the receipt and forwarding of a message.

9. Give the equivalents for the following conventional signals :

(a) 121-121-3-22-3.
(b) 12-12-3.
(c) 1111—3.
(d) 22-22-3.

(e) 121—121—33.
(f) 221-221-3.
(g) 2212-3.
(h) 33.

9. (a) Describe the field semaphore. (b) Name the different types of rockets and bombs used in the Signal Corps.

Solved September 6, 1909.

Department of Field Signaling, The Army Signal School
Codes-Problem No. 5. Time allowed, 2 hours,

NOTE:—Model to be followed when enciphering and deciphering messages when using the War Department Telegraph Code.

Key word "Gobel" subtractive, G-70, o=150, b=20, e=50, l-120.

PHRASE	KEY LETTER	NUMBER	CODE WORK
With reference to your endorsement of 1st	G-70	7635 70	
		7565	ANANAF
Immediate action will be taken	0=150	11165 150	
		11011	BABABI

1. Encipher the following message using the War Department Telegraph Code and the Key word "Grant" additive. Each letter in Key word having a value in tens according to its position in the alphabet:

General Barry,
Havana Cuba.
With reference to your telegram of the 5th ultimo, delay action until you receive our letter of November 2d. Advise us daily of any movement of importance.

Bell.

2. Decipher the following message using the War Department Telegraph Code. Key word "Shater" additive, Each letter in Key word having a value in tens according to its position in the alphabet:

General MacArthur,
Manila, P. I.
I B A N U M - I M I X A X - K E N U F A I K E D E K - D E D A D A - G U N U G I .

Ainsworth,

3. Decipher the following cipher code message; Key words : "Military Art?

Commanding Officer,
Ft. Leavenworth, Kansas.

K R H W P J D T P N T R E Y M F J Y R I X B X E J P P X Z J C W P V A G K C G F K J ;

Morton;

Solved September 13, 1909.

Department of Topography, The Army Signal School.

Problem No. 2. Scales. Time allowed, 2½ hours.

Show all your work in such shape that it can be easily understood.

1. On the small map just. handed you there is no scale of map distances and no R. F. but there is a place where two contours scale exactly 100 yards apart. Put on a R. F. and a scale of map distances to include 5°. Tangent 1°=.017; 2°=.034; 3°=.052; 4°=.066; 5°=.087. You may show the scale and work on a separate piece of paper, if desired.

2. A map containing 16 sq. mi. of country was made with a scale of 32 inch paces. When completed the border of the map measured 12 inches each way, What is the R. F.?

It was later found that the pace really averaged 30 inches in length. How large should the map be to correct the error? Construct a scale of yards for the corrected map.

3. A map has no scale. A certain distance on the map which measures 2 inches was covered on the ground in 3.8 minutes by a horse trotting a mile in 8 minutes. What is the R. F. of the map? Constructa diagonal scale, the least reading of which will be 50 ft.

4. A man makes a sketch at a scale of 3 inches-l mile, with a horse whose supposed rate of trot was a mile in 5 minutes.

Later in comparing the sketch with a correct map, scale 3 inches-l mile, he finds that a distance between two points on the correct map of 2 inches measures 2.1 inches on the sketch. What is the true rate of the horse and the R. F. of the sketch?

5. You have two maps of exactly the same ground, "a" and "b." On "a" .5 of an inch is the map distance between contours on a 2° slope. On "b" the same distance represents a 3° slope. V. I. of "a"=10 ft. V. I. of "b"=20 ft.

What is the difference in inches of a scale on each 2000 yds. long?

Solved September 30, 1909.

Department of Signal' Engineering, 'The Army Signal School.

Problem No. 7. Time allowed 3 hours.

1. (a) Two wires cross each other at an angle of 30 degrees. Currents in each flow toward the point of crossing; What effect will be noticed in the wires if they are pivoted at the point of crossing? Draw diagram.

(b) Two independent parallel wires are stretdhed in the same horizontal plane from vertical supports in an "E" and "W" direction. Currents of equal strength are passed through the wires in opposite directions. Describe the electro-dynamic effect on the wires. Draw diagram;

2. An electromagnet wound clockwise as viewed from the top, is fixed in a vertical position A wire freely suspended in a vertical position dips into a cup of mercury surrounding the top of the electromagnet. A battery is connected so that the current flows from the bottom of the electromagnet winding to the mercury, thence completing circuit through vertical wire to battery.

.(a) Draw diagram.

(b) What will be the direction of rotation of the vertical wire when current flows?

(c) What will be the direction of rotation if the direction of the current is reversed?

(d) The moving wire and the electromagnet are respectively analogous to which parts of a motor?

3. The edges of a pivoted copper disc dip into a trough of mercury located between the poles of a permanent horseshoe magnet. A current is caused to flow from the axis to the periphery of the disc.

(a) Draw diagram showing direction of rotation of the disc:

(b) If the direction of current through circuit is reversed what will be direction of rotation of disc?

4. Give rule.

(a) For determining the direction of an induced current.

(b) For determining the direction in which a wire free to move in a magnetic field will rotate when current is passed through wire.

5. (a) Upon what factors does the value of an E. M. F. depend?

(b) Give Lenz's Law of induced currents,

6. (a) Name five methods of producing momentary induction in the secondary circuit of an induction coil.

(b) Give Faraday's Law regarding E. M. F. produced in coil.

7. What do you understand by-

(a) Eddy currents?

(b) Hysteresis?

(c) Mutual induction?

(d) Self induction?

8. A parallel circuit of two branches is joined to a battery. Branch A contains an incandescent lamp branch B an electromagnet. When the lamp is turned on it does not light. When the connection at one of the battery terminals is suddenly broken the lamp burns for an instant with full brilliancy. How do you explain this? Draw diagram.

9. Draw a diagram illustrating essential parts of a simple ● ing form of closed iron circuit transformer showing-

(a) Co rnplete primary circuit.

(h) Instantaneous direction of current in primary and secondary windings.

(c) Instantaneous direction of magnetic flux when current flows through primary as indicated in answer to (a)

(d) Can a transformer be used on direct current circuit? Give reasons for your answer,

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Solved January 3, 1910.

Department of Signal Engineering, The Army Signal School.

Practical Electricity. Problem No. 3. Time allowed, hours.

1. (a) Define "Coulomb."

(b) What is the average rate of current strength in a circuit if the electrical consumption was 90,000 coulombs and the current used for 2½ hours?

(c) If a current of 10 amperes was maintained by a battery for 5 hours, what quantity of electricity, expressed in mpere hours, would be used?

2. It is desired to find the current strength in a circuit connected to a battery having an E. M. F. of 8 volts. There s available a mixed gas voltameter having an internal resistance of 7 ohms. The temperature of the room where experilent is preformed is 22° C. How would you proceed to determine the actual current flowing before voltameter was introduced in the circuit? Make a diagram showing connec-

tions and indicate from which plate of the voltameter the hydrogen is evolved.

NOTE.—Counter E. M. F. of voltameter equals 1.5 volts.

3. Using a current density of .05 ampere per squareinch, how long a time is required to copper plate both sides of an iron plate 1 foot square, supposing sufficient thickness is attained when the coating weighs 4 grams per square foot?

4. Give the laws for the electrical resistance of a con; ductor.

5. The resistance of a round copper wire per foot having a diameter of 1 mil (.001 inch) is 10.79 ohms, at 75 deg. Fahr. What is the length of a round copper wire .02 inch in diameter having a resistance of 5 ohms?

6. A round copper wire .05 inch in diameter having a length of x feet has a resistance of 10 ohms.

(a) What will be the resistance of a copper wire of equal length but with a diameter of ,025 inch?

(b) What will be the resistance if both the original diameter (.05) and the length (x) be doubled?

(c) What will be the resistance if the original area' be doubled?

(d) What will be the resistance if both the original area and length be doubled?

7 The resistances, X, Y, Z, are joined together in series and connected to a battary having an E. M. F. of 16 volts and an internal resistance of 1 ohm. By electrical measurement it is found that the pressure 'causing the current to flow through X is 4 volts.

(a) What is the value of the current flowing in circuit!

(b) If the resistance of Y is one-half that of X, what is the value of Z's resistance?

NOTE : 'X is an electromagnet wound with 1000 feet of B. & S. Copper wire having a diameter of .01 inch. K for copper equals 10.79 (resistance of one mil foot).

8. Three resistances. X, Y, Z, are joined in parallel **and** connectedto a battery having an E. M. F. of 30 volts, and an internal resistance of 1 ohm. The resistance of branch X=5 ohms, of Y-20 ohms. The drop in voltage between the point where the circuit branches and where the branches unite is 20 volts. Current in main circuit is 10 amperes.

(a) . What is the resistance of branch Z?

(b) What is the joint resistance of the divided circuit

Solved November 9, 1909.

Department of Signal Engineering, The Army Signal School.

Examination in Oil Engines.

1. Explain the series of operations that take place during the four stroke cycle.

2. In what way does the two stroke cycle differ from the four stroke cycle?

3. What is meant by: (a) compression space; (b) charge; (c) exhaust?

4. What is a carbureter?

5. What is the difference between the make and break and the jump spark sytems of ignition?

6. What is meant by timing the spark and how is it accomplished in the jump spark system?

7. Explain briefly, the purpose, location and construction of the spark plug.

8. What determines the order in which the charges in a four cylinder engine must be fired?

9. For what system of ignition are high tension magnetos employed?

10 An engine using jump spark system of ignition cannot be started; for what reason would you inspect the spark plug?

Solved March 14, 1910.

Department of Signal Engineering, The Army Signa School.

Laboratory. Practical Exercise No. 4-A

To determine the number of ampere hours and the watt hour efficiency of certain primary cells:

Assume that the usefulness of the primary cell studied, is at an end when the P. D. drops to one volt on closed circuit.

See that the cell is in good condition. Measure its internal resistance. Then connect it in series with a resistance of three ohms. Read the P. D. when circuit is closed, and every half hour thereafter during the afternoon. After taking the last reading, disconnect the three ohms resistance and leave the cell on open circuit until the next afternoon. On resuming work, first take the E.M.F. of the cell, then measure the internal resistance using the three ohms as standard resistance. The E. M. F. on open circuit and the P. D. at the *instant* of closing the circuit are used in this. Note if the P. D. at instant of closing circuit is less than one volt. If so the cell is exhausted beyond further practical use. If not, continue the

work from day to day until less than one volt.

Plot a curve using P. Ds. as ordinates (scale 3″=1 volt) and times as abscissae (scale 2″=30 min.)

Compute :

1. Ampere hours of cell,
2. Watt hours of cell,
3. Useful watt hours of cell,
4. Lost watt hours of cell?
5. Watt hour efficiency of cell,

Department of Signal Engineering, The Army Signal School.

Laboratory. Practical Exercise No. 18X.

Submit a brief report on the following instruments:

1. Local battery telephone, desk type.
2. Local battery telephone, wall type.
3. Composite telephone, artillery type.
4. Field artillery telephone.
5. Field telephone.
6. Common battery telephone.
7. Field buzzer.
8. Cavalry buzzer.
9. Medhurst buzzer.
10. Field induction telegraph set.

This report should include a simplified diagram of the circuits, a brief description of the instrument and a short statement of its method of operation. The report on each exclusive of the diagram, should not exceed one page. Resistances of coils, receivers and transmitters, and capacities of condensers should be measured and reported.

Department of Signal Engineering, The Army Signal School.

Recitation Problem No. 1. Manual No. 3. Time allowed, 1¼ hours.

1. Make a diagram of
   (a) Bridging ground line with three telephone stations.
   (b) Series metallic line with three stations.

   NOTE : No detailsof connections inside instruments required.

2. Make outline diagrams of connections
   (a) Local battery telephone station.

(b) Common battery telephone station.

3. Give a brief statement of the operations necessary .th a local battery switchboard from the time a call is given itil stations ring off. What necessary part of switchboard in circuit at each stage?

4. On a local battery ground return bridging telephone .e of two stations, state probable character of faults.

(a) Home station receives speech well but distant station reports talk weak.

(b) Stationrings without apparent cause.

(c) Home station rings bell weakly, but others ring this bell strongly.

5. Make a diagram of connections of field buzzer.

Fort Leavenworth, **Kansas,** January 20, 1910.

The Army Signal School-Memoranda on Technical Conences.

Attention is invited to the Technical Conference schedulfor the 10th inst. at 9 a.m.

Members of the Signal Class will submit to this office on before the 9th inst. any matters of interest which they de-? to present before this meeting.

The object of these conferences is to bring the members he Signal School together, as an assembly of officers conied for the purpose of reviewing, investigating, discussing, 1 reporting upon matters of scientific and military interest ring on the work of the Signal School and the Signal Corps.

The members of the Signal Class are encouraged to pret before these meetings anything of interest which they y happen to run across in current literature, and anything ich they develope or originate in the course of their work his school, which will serve to keep us abreast of the times benefit us as a class, as a school, and as a corps.

Original ideas, experimental investigations, and improvets of the old are especially sought in these conferences.

Criticism of a logical and consistent nature does much tod rounding out and improving an idea, a theory or a sugLion, and a free discussion of all matters brought up before se sessions is desired.

It is expected and hoped that all the officers of the Sig-School will make these conferences an interesting feature his course.

The record of each meeting including matters brought ore it, and the action of the assembly will be printed and ies sent to all officers on the mailing list of this school.

In this manner the results of our investigation and work w be spread throughout the Corps and may in many instanc prove of interest and perhaps of value to many other mer bers thereof.

November 2, 1909.

Department of Signal Engineering, The Army Sigr School;

Construction of permanent telegraph lines. Problem No,

Our army has been pressing the hostile army towards t west. Our base line has been constructed as far as Pla City. Our forces have occupied Easton. The terminal brid all railroads and telegraph lines between Platte City a Easton have been completely destroyed.

The Rock Island bridge has been sufficiently repaired the Engineers to permit of the passage of troops and tra portation.

You have been directed to replace the field lines conne ing Platte City and Easfon by a permanent, two wire telegra line, thus extending the base line of information.

Requirements :

1. Show route in blue pencil on map furnished, alc which you intend to build this line having offices at Bevea Fort Leavenworth, Leavenworth and Easton.

2. Submit estimate for detail of men required to constr line in two days after delivery of material, etc., and state ganization of your working party.

3. Make requisitions for

(a) Tools.
(b) Materials.
(c) Instruments and office supplies.
(d) Transportation.

4. Specify places and distribution of materials, suppl: tools, etc., preceding construction.

5. State general method pursued in erection of line (r erence pages 106 to 118 inclusive, Manual No. 3).

NOTE : Solution of the above problem will be turned i the office of the Assistant Commandant, Army Signal Sch not later than 1910.

Reference may be had to any book or publication in solution of this problem, but consultation with other mem of the class is not permitted and solutions will be signed this effect.

Answers will be submitted stri.ctly in accordance with the spective heads and sub-heads.

Department of Signal Engineering,. The Army Signal hool.

Alternating Currents. Problem No. 5. Time allowed, 2 ours.

I. A circuit consisting of a non-inductive resistance in eries with a condenser of 18 microfarads takes .5 ampere om 110-volt, 60 cycle mains.

(a) Calculate value of reactance E.M.F.

(b) Calculate value of non-inductive resistance.

2. A circuit containing a non-inductive resistance of 50 hms in series with a condenser of 20 microfarads is connect-d across 110-volts, 60 cycle mains.

(a) Calculate the value of the capacity reactance.

(b) Determine by means of vectors (impedance triangle) the value of the impedance of the circuit. Scale in (b) 1 inch=20 ohms.

(c) Calculate the value of the current in the circuit.

(d) Calculate the drop across the 50 ohm non-inductive resistance.

(e) Calculate the drop across the condenser.

(f) Does the current lag behind, or lead, the impressed E.M.F. and by what angle?

(g) Prove by means of vectors (E. M. F. triangle) that answers obtained in (d) and (e) require that an E.M.F. of IIO-volts be impressed. Scale in (g) 1 inch=20 volts.

Solved April 12, 1910.

Department of Signal Engineering, The Army Signal chool.

Alternating currents. Problem No. 9. Time allowed 3 ours.

NOTE: Table of tangents furnished with problem. Table f cosines furnished upon request.

I. Three circuits A, B, and C are joined in parallel and onnected between IIO-volt, 60-cycle mains,

Circuit A, R-20 ohms, Lo-20 ohms.

Circuit B, R-50 ohms, $L\omega$=180 ohms.

Circuit C, R-300 ohms, $\frac{1}{C\omega}$=251.7 ohms.

Determine by means of vectors:

(a) What current is flowing in the mains?

(b) What will be the reading of a wattmeter if placed the mains?

(c) What must be the value of the equivalent nonindu tive resistance, inductive reactance or capacity reactance of single circuit which, when substituted for the three circui considered would have a value for impedance equal to tl joint impedance of the three circuits?

Note : Scale, 1 inch-20 volts
1 inch=2 amperes.

2. At a frequency of 60 the $\frac{1}{K\omega}$ of a certain condenser 220 ohms, and the $L\omega$ of a certain inductive coil is 100 ohm The resistance of the coil is 20 ohms. This condenser, co and a non-inductive resistance of 50 ohms are connected series across IIO-volt, 60-cycle mains.

(a) What is the Power Factor of the circuit?

(b) What will be the reading of a wattmeter placed this circuit?

Note : Scale, 1 inch-20 volts.

3. A sine curve diagram shows an alternating current 5 amperes *maximum* in phase with an E. M. F. of 160 vol maximum.

(a) What will be the reading of a wattmeterplaced in tl circuit?

(b) What is the Power Factor of the circuit?

Solved April 23, 1910.

THE ARMY SIGNAL SCHOOL

DEPARTMENT OFENGINEERING

Fort Leavenworth, Kansas, August 31, 1910.

THE SECRETARY,
The Army Signal School.

SIR:

I have the honor to submit the following report of the work of this department for the School year 1909-10:

The 20 half-days allotted to this department were used as follows:

FORTHEGRADUATES OF THEARMYSCHOOLOF THE LINE

Assisting in the instruction of the non-graduates of

The Army School of the Line,	6 half-days
Road sketching,	8 half-days
Position sketching,	5 half-days
Place sketching,	1 half-day

FORTHENON-GRADUATESOFTHEARMYSCHOOL OF THE LINE

Conferences in sketching,	6 half-days
Practical work, preliminary position sketching,	3 half-days
Practical work, preliminary outpost sketching,	1 half-day
Practical work, preliminary road sketching,	4 half -days
Practical work, record position sketching,	2 half -days
Practical work, record outpost sketching,	2 half-days
Practical work, record road sketching,	2 half -days

The instruction was under the entire charge of

Captain Willey Howell, 6th Infantry, who took this work in addition to his duties as instructor, Department of Law, The Army School of the Line. He conducted the work in a most thorough and able manner.

Very respectfully,

J. A. WOODRUFF,

Captain, Corps of Engineers,
Senior Instructor,

THE ARMY SIGNAL SCHOOL

DEPARTMENTOFLANGUAGES

Fort Leavenworth, Kansas, August 31, **1910.**

THE SECRETARY,

The Army Signal School.

SIR:

I have the honor to submit the following report of the work of this department for the school year 1909-10:

ALLOTMENTOFTIME

Sixty-four half-days were allotted to this department; the work began September 30, 1909, and ended January 10, 1910.

COURSES OF STUDY

The Signal School and Staff Classes are combined in instruction in languages. All the language courses open to the Staff Class are also open to the Signal School and subject to the same restrictions.

Captain G. E. Mitchell, 13th Cavalry, a graduate of the Line Class of 1909, elected German; all of the other students of the Signal Class were not deemed sufficiently fluent in Spanish to warrant their taking another language; all were therefore, assigned to Spanish.

Three courses in Spanish were provided for the Signal School: the Advance Course (taken in connection with members of the Staff Class assigned to Spanish), Elementary Course, 1st Section, and Elementary Course, 2d Section. Assignments to these courses were made depending upon the knowledge of Spanish and ability to learn the language, as shown

in the class room. The final assignments were a: follows;

Advance Course:--Lieutenants Leonard and Ri ley.

Elementary Course, 1st Section :-Lieutenan Goodrich, Captain Hartmann, Lieutenant Mauborgne Lieutenant Prosser, Lieutenant Singleton, Captain Wallace.

Elementary Course, 2d Section :-Lieutenant Bow man, Captain Clarke, Lieutenant Esty, Lieutenan Higgins, Captain Stamford.

The text books for the German course and th Advance Spanish course will- be found in the repor of this department on the Staff Class work; the mem bers of the Signal School Class pursuing these course; took only the first 64 of the 93 lessons scheduled fo: the Staff Class.

TEXT BOOKS, ELEMENTARY COURSE

Ramsey's Grammar.
Elementary Course in Spanish - Department.
El Castellano Actual - Román y Salamero.

The daily lessons may be found in the list of les, sons, Elementary Course.' The 1st and 2d Sections o the Elementary Course followed the same list of les sons, but the lessons for the 2d Section were sufficient ly shortened to bring them within the capacity of th members of that section.

The progress of the several members of the Sig nal School Class in German, in the Advance Course in Spanish, and in 1st Section, Elementary Course ir -Spanish, was very satisfactory; as much cannot be said of the 2d Section, Elementary Course in Spanish

The division of the Elementary Course students into two sections'and grading the lessons according to the ability of the sections, resulted in carrying seven of the twelve students that took the Elementary

Course through a very satisfactory line of work and in getting good results from the seven; had all twelve been placed in the same section, the progress of the more capable of the twelve would have been little greater than that of the least capable. Of the members of the 2d Section, Elementary Course, practically none had ever given any serious attention to Spanish before entering the School, although nearly all of them had had opportunities for studying and using the language.

THE INSTRUCTORS

The work of Captain D. E. Aultman, 5th Field Artillery, as instructor of the Advanced Spanish Course, of Captain J. A. Moss, 24th Infantry, instructor of French, and First Lieutenant Walter Krueger 23d Infantry, instructor in German, has been touched upon in the report on the Staff Class work. The 1st Section of the Elementary Course was taught by General Frederick Funston, Commandant of the Schools, who very kindly placed at the disposition of the department his very good knowledge of Spanish; this assistance was of great benefit to the students pursuing the Elementary Course; without it, all the students pursuing this course would have had to be put into the same section, to the detriment of all, or the class-room periods would have had to be cut down from two hours to one and a half hours each, which would have occasioned a loss of 25 per cent of the time of actual practice in the class-room.

The 2d Section of the Elementary Course was taught by Captain H. W. Miller, 13th Infantry, who gave to his work the painstaking care and intelligence that always characterises his work. While the ultimate progress of this section was not satisfactory from the standpoint of a good knowledge of

Spanish, yet, considering that the section started from a point on the scale very near to the absolute 0 of arithmetic, fair progress was made by most of the members of the section.

The efficiency of this year's Signal Class in languages is far below what it should be. There was at the beginning of the course but one member of the class that was deemed sufficiently well posted in Spanish to warrant his taking up a new language; of the rest of the class there were but two that were far enough advanced in Spanish to warrant their taking the Advanced Course.

This shows that the students of the Signal School are not taking advantage of the opportunities and facilities for language study that are here offered. A large majority of the graduates of the Signal School leave the School with only an elementary knowledge of Spanish.

As was pointed out in last year's report, Signal Corps officers in time of war will probably have more use for a knowledge of foreign languages than officers of any other branch; for that reason officers contemplating detail or service in the Signal Corps should make every effort to acquire a knowledge of the more important foreign languages. To take full advantage of the facilities for language study afforded by these schools, students intending or expecting to enter the Signal School should make every effort possible to obtain a good knowledge of Spanish before entering the School, in order that they may take French or German during their year's course and thus go out from the School with a good knowledge of at least two foreign languages.

Very respectfully,

ARTHUR THAYER,

Captain, 3d Cavalry,

Senior Instructor.