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The Coast Artillery Journal

Vol. 57 No. 4 OCTOBER, 1922 Whole No. 194

The Army War College

By Major General Edward F. McGlachlin, U. S. Army

EDITOR'S NOTE.—This paper, in substantially its present form, constituted the opening address of the Commandant at the initial session of the War College for the year 1922-1923. We are truly indebted to General McGlachlin for his permission to reproduce this extremely significant document in THE COAST ARTILLERY JOURNAL.

THE scope of this paper is limited to a discussion of the Army War College as it is today and as it is intended to be for the coming year; its place in the army educational system; its peculiar object or purpose; the general principles and some of the detailed methods of its conduct. As it is not intended to present an analysis of the subject covered, there will therefore be omitted any particular relation of its pre-war development, of its beginning as an organ of general staff work; its becoming an adjunct of the general staff; its separation into an institution of learning; its change of purpose from doing things to learning how best to do them; its rejection always of academic instruction for the applicatory system pursued alike by faculty and students; its inclusion of the subjects of strategy, logistics, tactics and hegemonics; its exchange of students with the Navy; the recognition of the principles of selection, test and competition.

Suffice it to say that upon our entry into the world war, the college had become a small body of mature associates or colleagues, consisting of faculty and students, in a school of application for the development of command and general staff qualifications by lectures, individual study, original research, map problems, war games and staff rides. Civilian lecturers had commenced to be called upon. Graduates were retained as instructors and Navy officers were used as consultants.

Our experience during the World War emphasized a necessity, theretofore recognized but not universally foreseen, for a wider and intimate acquaintance either by Army officers with civilian activities or by civilians with war needs. "Dollar-a-year men" of the highest capacity and attainment along political, commercial, industrial, financial, agricultural, and professional lines were impressed to perform duties fundamental to maximum war endeavor and success, of whose strictly military essentials they knew almost nothing. Officers were thrown into waters made deep and rough by their ignorance of business and resources, of history and politics, of the psychology, aims and desires of races and of nations. As Marshal Foch says of the old Ecole de Guerre, we had simplified our training equation by the omission of many important variables.

Through an experience of the increasing complexity of wars conducted by nations in arms came an enlarged appreciation of the necessity for developing all resources in money, men, materials and supplies by a military agency which, to accomplish its purpose, must be composed of men thoroughly in touch with world affairs.

As we cannot control the education along military lines of captains of industry and of leaders of thought, we must develop officers to take over themselves the work so generously and patriotically performed by civilians during the war. Or, at least, they must be taught, through their understanding of the civilian side of the problem, to guide effectively the activities of those called upon.

From the Summer of 1917 until the Fall of 1919 the activities of the college were suspended, but early in the latter year the late Major General James W. McAndrews was selected as Commandant and was given a wide choice of members of the faculty. Some of these met him at Treves, Germany, in March and there was developed a proposed course for the next college year. Contemporaneously, study of the subject was progressive in the War plans (now the Operations and Training) Division of the General Staff. As a result of conferences on these studies, the first year's program was outlined.

In brief, there was to be an estimate of the situation and a determination of the war of large proportions in which we might most likely become engaged; the selection of the most unfavorable theatre of operations consistent therewith; conclusions as to the probable effort of the enemy or of the hostile coalition; the reaction of the United States in all its phases—psychological, military, naval, political, economical, financial,—and recommendations for the expansion of the War Department to meet war-time needs. As to the future, it was believed that no one course would exhaust any one problem and it was expected to modify plausibly the original assumptions with the view of preparing for possible contingencies.

The College, that is, the faculty and students as a whole, was to

take up in turn the duties of the various General Staff Sections; studies of subjects assigned by the faculty to committees were to be made and recommendations were to be submitted; coordination was to be accomplished by the faculty; and important questions of principle and policy were to be discussed by the whole College, but decided by the Commandant or by the Director concerned.

The first course was admittedly one of experiment.

Under the new name of the General Staff College the year commenced early in September. In 1921 the old name was resumed without any modification of purpose, and this, The Army War College, will be used herein.

Not until September 25, 1919, was General Orders No. 112, War Department, issued. It is the fundamental order governing the army school system. (1) Confining our attention to the General Service Schools,—

a. The School of the Line is to train officers in the combined use of all arms and services functioning with a division, including the functioning of corps and army troops and services in their relation to the division, and in the duties and responsibilities of field officers with regard to education and training in the army.

b. The General Staff School is to train selected officers for duty as General Staff officers with tactical units and for higher tactical command.

c. The Army War College is to train selected officers for duty in the War Department General Staff and for high command.

d. Special courses for general officers and for selected officers of the technical and administrative services are prescribed for the last two schools.

Doctrines and methods are to be those approved by the War Department and the general purpose is to ensure harmonious cooperation throughout the service.

The statement of the course for 1919-1920 prescribed that the work would take the form of problems, conferences, lectures, and actual examination of the details of the work properly falling to the General Staff in peace and in war so that the faculty and students would be fully oriented in the functions of its various divisions or sections as they actually existed.

A review of the details of the course would here take too much time. It was followed as planned but some work was also done in cooperation with the War Department General Staff.

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(1) There are to be changes in orders and regulations governing the school system, but as these will not be essentially modified the course for the current year at The Army War College, it has been deemed best to consider only those now in effect.

In addition, the College visited terrain selected as a theatre of operations and there tested its conclusions as a result of which they might be revised.

There were no special courses for general officers or for those detailed from the technical and administrative services. There were special students during the first year, but their participation in work not peculiar to their services was purely voluntary and was not reviewed by the faculty. There have been no special students since.

It is interesting to note that little time was devoted to training for high command, unless, as is wholly correct, acquirement of knowledge of the methods of general staff work be accepted as an indispensable part thereof.

Experience proved that the principles underlying the course were correct, but pointed to some desirable changes in detail. As to the problem forming its basis, it was certain that its solution was not complete. So it was presented a second time, but the record of investigation and research by the preceding class and its tentative conclusions were accepted for further study and elaboration. The successive steps followed were almost exactly the same.

Time was allocated, however, with the view of teaching the Art of Command through historical rides, map maneuvers and strategic reconnaissances. Only a premature closing of the College prevented the prosecution of this subject to completion.

During that year there was specifically interjected into the course a consideration of the subjects of Leadership and Morale, the Relations of Geology to Military Operations, International Law and Military Government.

The next year's course was conducted along these lines. G. O. 112 also provides for certificates of proficiency in terms that have been interpreted so that only officers who satisfactorily complete the whole course are given credit for graduation, and that students "deemed unfitted for any reason to continue the course" shall be recommended for relief.

On September 14, 1920, General Orders, No. 56, War Department, was issued supplementary to and in elaboration of General Orders, No. 112. It is remarkable in several respects as clarifying doubtful questions.

It states that the general mission of the General Service Schools is:

To train officers in the—

Strategy and tactics of large units.

Functions of commanders of large units.

Functions of General Staff officers serving with Troops and at the War Department.

It emphasizes the necessity of teaching—

The true functions of the technical staff officers whose work is to be coordinated by General Staff officers.

The difference between the functions of the commander and those of a General Staff officer.

It gives as special missions of—

The School of the Line:

To train officers in the—

Combined use of all arms in the division.

Proper functions of commanders and of General Staff officers of divisions.

The General Staff School—

To train officers in the—

Strategy and tactics of large units.

Functions of commanders and of General Staff officers of divisions, army corps and armies.

The Army War College—

To train officers for—

(1) High Command.

(2) War Department General Staff duty.

The order expresses the opinion that appointment of general officers will eventually be from general service school graduates and recognizes the principle of competition. Consequently "all officers who show judgment, capacity, and willingness of application, should have an opportunity to compete in the most complete manner possible for membership in all the eligible lists."

As to competition, attention may be called here to its recognition in the National Defense Act, which, excepting the initial list, limits General Staff eligibility to graduates of the General Staff School and War Department General Staff eligibility to General Staff eligibles who graduate from The Army War College.

But, although competition is recognized as a feature of the system, it is not narrowly confined to the time spent as a student. The officer always has a future.

"All graduates of the School of the Line and those officers who have received the equivalent of such training, either in active operations or otherwise, are to be considered as eligible each year when selections are to be made for the course in the General Staff School." (G. O. 56 W. D. 1920, p. 5.)

Such graduates, "though not selected at once for training in the higher schools, are to be considered in the list of eligibles for this training, provided their subsequent work * * * shows that their development * * * justifies their later selection * * * * * *." (G. O. 56 W. D. 1920, p. 5.)

Detail to attend The Army War College will be made from:—

Graduates of the General Staff School or its predecessor, the Army Staff College, whose suitability for higher training in command or staff duty, or both, has been fully established by their work at the schools, or whose detail is justified by their subsequent records;

All officers on the initial eligible list of the General Staff;

Selected officers of the noncombatant branches in numbers announced from time to time by the War Department.

Eligibility was later extended to include "other officers, not less than 48 years of age, whose suitability for higher training in command duty has been fully established by their work in the Army." (G. O. 23 W. D. 1921.)

Slight changes have been made since in the factors of eligibility but these do not affect the principles of selection. But without any orders on the subject the moment that the number of eligibles is greater than the number than can physically be accommodated or than the number that is necessary for a particular duty or class of duties, there must be exercised the power and responsibility of choice. Selection implies comparison. The aspirant for selection realizes this, sensibly or insensibly, and struggles to surpass his neighbor. Without recognition by authority, the fact of competition would exist. It is natural. It is instinctive. It is imposed by necessity. It is a virtue of successful men. When from a command an officer or a soldier is selected for any particular duty or position, the principle of competition is justified and encouraged. It is not the existence of competition that may properly be attacked but the vices that occasionally accompany it, such as jealousy, selfishness, deceit, flattery, subserviency, moral cowardice, dependency.

The efficiency reports to be submitted by the Commandnant (G. O. 56 W. D. 1920) are to be amplified to include:

The General Staff School:
Suitability for higher training in command and in staff duty, and special qualifications.

The Army War College:
Suitability for high command, and for War Department General Staff, and special qualifications.

From the above discussion of the traditions and practices and development of the old Army War College, and statement of what the new college has done since the war, it is plain that the principle of selection is adopted, that the fact of competition is recognized, that a rather high standard of matriculation is conceived, that serious accomplishment is required for graduation, and that a critical report on students is called for.

During the first thirty months it was the practice for the Commandant to advise with the faculty as to the efficiency of students. This

custom was not changed by regulations (A. R. 350-110, par. 11, p. 3.) then received which provide that a faculty board consisting of the commandant, the assistant commandant, and the directors shall determine by majority action "all matters relative to standing, rating or classification, proficiency or deficiency of all students," such action to "be final, subject only to War Department review." A majority of the board constitutes a quorum, but final action has not been taken in matters of this nature except with full attendance.

There are other very important statements in G. O. 56 that may be paraphrased to the following enunciation of the purpose of the whole system of schools for officers. It is to provide the maximum possible number of officers from all available sources who may be able to qualify by correct training in theory and practice for all positions in command and staff, not only for the peace establishment, but as a reservoir of trained officers qualified for organizing and developing to its maximum capacity the potential military power of the Nation.

A fair conclusion, from a study of the law, of orders in effect, and of good custom developed by difficulties of the past, seems to be that there should be permitted to finish the course the maximum possible number of officers of good judgment, capacity and willingness of application; that there should be eliminated promptly, regardless of previous record, those who, through indifference or inattention persisted in after warning, or through physical disability, are found to be unsuitable for continued training in command or staff duty; and that certificates of graduation should be given to those only who have established probable suitability for high command or for duty in all divisions of the War Department General Staff.

Clearly it is only a man of merit who will fill either one of these two requirements, and it must become a question of the greatest importance to decide justly and to reach a fair balance in the interest of the government, of the service, and of the individual. An estimate of the quality of each student's work, written or oral, must be made and recorded and, as ability to turn out meritorious product does not ensure effectiveness of its application, the student's characteristics must also be weighed.

Rarely can the solution of a problem or the submission of a report be evaluated as is done in other institutions; for only infrequently is there a definite undebatable answer. In the great majority of cases the instructor must take cognizance of the time and the facilities had by the student, of the character of the duty imposed upon him in respect to its possibilities for development. He must then by study and analysis decide the extent to which the student gave evidence during the course of possessing mental and tempermental fitness for duty in high command or the War Department General Staff. He must take cognizance of the method adopted by the committees for organization and work,

must study and consider every paper prepared and submitted, must note the character of presentation in conference, the questions and answers during discussion. And, in determining the rating group into which the officer falls, he must bear in mind the great variation in opportunity offered by the subjects necessarily assigned different committees and to different officers within each committee. Some subjects lend themselves to a brilliant and striking development and presentation and much data are available for preparation; in others the reverse is the case. Remembering how greatly the final report may affect the professional reputation of the officers taking the course, the gravity of the responsibility placed upon the instructors in this respect can be appreciated as well as the amount of work required if they are to satisfy their own consciences in its performance.

A terminology has been established by the authorized efficiency report form both for characteristics and for qualitative ratings on any subject. That terminology has been found to be very satisfactory.

The student is classified in each course by its faculty division as superior, above average, average (divided into a high and a low group), below average, or inferior. Numerical marking is forbidden and qualitative grading required.

In general, in any large group, it is estimated that under the above ratings there will be from 0 to 6 per cent in the first, from 7 to 25 in the second, about 30 in the third, or in the long run about 3, 17 and 30 per cent. In the descending ratings these proportions will apply inversely. Within any rating group no effort is made to fix the student's position, his name appears alphabetically. No effort is made either to divide the class according to the percentages given above.

As soon as possible after the completion of each course the division concerned reports to the commandant the cases of all students whose work is unsatisfactory or indicative of unsuitability for War Department General Staff duty in the corresponding division. A critical analysis of all of such a student's work is submitted at the same time for review by the Faculty Board. As soon as practicable thereafter a report on the whole class is made for similar review. It is upon the basis of these reviews that students are informed that their work is satisfactory or unsatisfactory. At the same time, those who are reported unsatisfactory are handed a copy of the critical analysis and invited to a full, free, and frank conference with the Director of the Division concerned.

The Commandant welcomes visits from all members of the College. He personally gives to students the information just outlined and as much more that is asked as is available. There are no secret opinions to be withheld.

In rating work produced, whether written or oral, the importance of the subject assigned or of the part played by the student, as well as

the completeness and quality of the product are considered. That this is all nothing new is indicated by the following quotation from the Orientation Lecture of 1920:

"These classifications are not based on forms or precedents, but each paper is considered in the light of a General Staff paper—is it clear, concise, definite, complete, sound, logical, and original? Form and quantity count but little; substance and quality much. In the conference, your presentation of a subject counts—is it a calm, logical, dignified presentation? In the exercises in higher command you are judged by your plans, your adherence to a plan once formed until it is proven that the plan must fail—in short, by that highest of all qualifications of a commander, the courage of responsibility." (Colonel Harry A. Smith, Acting Commandant, 1920.)

There are three other things to say on this subject. First, unsatisfactory reports are not condemnatory; they are at first tentative; they are redeemable by subsequent efficiency along the same or comparable lines.

Second, a rating of inferior in a small group is not synonymous with unsatisfactory. And, while in a highly selected group it is inconceivable that a superior student could be unsatisfactory, in theory the situation is quite possible.

Third, the rating is within a small group. It does not, therefore, of itself, indicate sufficiently where the individual falls in the large and general group of the great body of officers. It is, therefore, necessary that efficiency reports based on such ratings be supplemented by the ratings of a class as a whole as compared with other classes, and by statements of the number in each class and of the number of students who were more highly rated than the subject of report.

The "marking system" of the army schools has always been a subject of fierce contention. No one has ever been able to avoid it. Its necessity to the institution, to the student, and to the War Department should be obvious upon a little reflection. It is nothing in the world but a standardization of the method of forming an opinion. Instead of being nebulous, changeful and uncertain it is purposeful, of record and subject to analysis. But at the Army War College odious comparison is reduced to its lowest limits and should not lead to any of the vices of competition. There should not be competition between individuals but there should be aspiration. The record will be kept in a generous spirit of helpfulness to the service and to the individual with the view always of adding fully competent officers to the various eligible lists.

Quite the opposite to competition the officer who helps another will forward not only that officer's efficiency but his own and will enlarge the usefulness of both in their chosen profession.

From the viewpoint of the person who is the subject of efficiency reports, the system may be attacked on the ground that these may be

unreliable through possibility of the reporting officer's bias, prejudice, intentional unfairness, insufficient observation, error of judgment, defective insight into character, ignorance as to whether a condition is permanent or temporary. But the subject is protected by the requirement that he be informed of unfavorable entries of fact and that his reply may accompany the report; injustice is not probable when opinion is notably uniform among a number of contemporary observers; and unfairness is corregible by comparison of reports with others from independent sources. Examination of hundreds of officers' personal records gives the general impression that they favor the individual rather than the government, that they are lenient rather than strict. Likewise it is certain that in comparing and digesting such reports full credit is given to favorable entries while unfavorable ones are discounted or at least very cautiously considered.

The broad field of eligibility precludes a class uniformly trained upon matriculation. But, if an orderly progression is to be followed in the pursuit of definite standards, there is no place or time for making up individual deficiencies except through initiative and study by the individuals themselves. To review preparatory subjects would waste the time of the informed, to introduce extraneous subjects would steal time from essential work.

It has been thought by some that the work was too confining. But the course cannot be laid out for the ill-prepared or measured to the physical condition of the weakest. Again would be wasted the controlled time of the mentally and physically fit student. As a matter of fact there is no evidence that the course itself has had a deleterious effect upon the health of the class. It has been laudable ambition for improvement, praiseworthy but exaggerated devotion to duty, neglect of reasonable precautions as to health, or disease and infirmity established before arrival that have been the real causes of comment along this line. It is true that individuals have had to be cautioned to let up on their work, that the faculty watches for ill effects of over-application and that the program has occasionally been eased off in order that the best work may be done. But if physical exercise is taken on the tennis court and golf course on the site of the college, or in Potomac Park, at the country club nearby, at gymnasiums in the city, or by simply walking to and from work, if advantage is taken of the numerous opportunities for social enjoyment and mental relaxation so generously afforded, there can be no just complaint on the score of over-work. Exercise, proper diet, correct desk hygiene, attention to the temperature and moisture in rooms, good light and the drinking of plenty of water will keep all physically up to the mark.

There is still a survival of the idea that to learn by doing should mean that current problems should be solved. This is nothing but a belief in experience being the best teacher. So it is, and the slowest

and most expensive, the one to be resorted to only through necessity. The purpose of the College is to learn effective methods. Its field cannot be covered if its activities are merely opportune, if they are left to accident and fortuitous circumstances. For the best cultural results the whole college year must be carefully divided and assigned to particularized subjects. But while there is opposition to the sudden reference to the College of immediate questions, the ramifications and demands of whose solution it would be impossible to foresee, and which would certainly interrupt or upset the definite scheme of progress, welcome is extended to such questions based on an actual situation as may come in a timely way for inclusion in a course in preparation. In this way not only is interest stimulated but practical results are obtained that have been valuable to the War Department.

In the investigation of the questions coming before the College an immense amount of laborious effort must be expended. The field is so broad, the subjects are so recondite, the matters are of such continuing importance, conditions so subject to change, that inquiry is never ended. Their perpetual interest and their fluidity, combined with the possibility of always broadening the field of activity, furnish ample opportunity for extensive practice in methods without starting always *ab initio*. So the past work of the College is freely offered for correction in the light of changed circumstances and for elaboration toward more complete and timely solutions. All faculty members and students are required to include a list of authorities and references, with some enlightening comment as to their value, in the report resulting from each study made.

There is an important service which members of the College can render. That is to assist in the establishment of good relations between officers and the public and between officers and the Congress. It is not thought that this should be brought about by propaganda of any sort but that it is quite feasible through mere acquaintance, social intercourse, mutual understanding, resulting cordial and sympathetic relations, and calm discussion. It is advised, therefore, that students seek to enlarge their circle of civilian acquaintance. But with this goes a warning against political activity and against efforts to influence legislation. Both are contrary to orders. The former brings the Army into disrepute. The latter is a violation of our oaths of loyalty and obedience which impose upon us the obligation of acceptance of the adopted policies of the War Department and of its conclusions as to military legislative needs. Similarly, as to the laws adopted by the Congress and approved by the President it is indisputably our duty to uphold them. Through the War Department, where current opinion of the Army is weighed, where differences are studied and reconciled and where arguments are considered and massed, and through it only can a united front be presented. The whims, caprices, fancies, od-

dities and self-interests of individuals, however attractive, must be submerged in wise action for the common good.

In 1908 the college building was dedicated, Mr. Root delivering the principal address. Some of his advice was as follows:

"Settle your military questions within the limits of the military establishment * * * then let the * * * Secretary of War go to Congress with the results * * *. This is the time to learn to serve together without friction * * *. Keep dissension and jealousy out of the United States Army * * * *. The conditions of army life are such as to narrow your view. Strive to broaden your sympathies by mingling with those outside the service and learning from them the things they can teach you."

In every class many have found very considerable difficulty in the use of the library, but this seems to have been met most frequently by those who tried to dispense with the services of the library personnel. Bibliography for study will be frequently suggested, members of the faculty will always help by investigation and advice and both the officer in charge of the library and the librarian are informed, competent and sympathetic. The real remedy is first to learn how to consult the catalogue, then list the references wanted, then call on an attendant for them; second, to learn to consult tables of contents and the indexes of references, to select the important parts for study and to avoid the temptation to read the whole work, however entertaining or instructive it may be on issues not cognate to the investigation.

Experience in many libraries proves that much time and effort are lost by seekers which might have been saved by a simple statement to the librarian of the subject of their search.

Another channel through which research may be conducted is the Historical Branch. The office of its chief is in the building. He gladly performs any service and affords any assistance possible.

Within a few days of the opening of last year's course it became necessary to say that we seek a profoundness of knowledge, a sense of responsibility and self-reliance, a feeling of independence and initiative that will make graduates leaders of thought and action, not followers. These attainments are to be reached by no shortcuts but only by industry, meditation and action,—qualities that, highly developed, have marked the greatest commanders.

Observation indicated that some were not pursuing correct methods in approaching their subjects. There was noted a chronic desire on the part of a number to visit hastily and without preparation the Congressional Library, the Pan-American Union, the Departments of the Government and the Bureaus and Divisions of the War Department, although there may be found at hand nearly all the data required for a proper presentation of any subjects assigned.

Such procedure corrupts self reliance and is a pure waste of time

but there is another phase, important in its effect upon the service at large. When an officer of the Army seeks information from an expert in another branch of the Government, he should be prepared to discuss the subject intelligently and dispassionately. He should be able to point out just what information he lacks and in what form he needs it. He should be able to give as well as to seek information. Unless he is able to do this he makes a bad impression and is dismissed with a bundle of printed pamphlets, all of which are available in the beginning.

Toward the end of the college year students are called upon for constructive criticism, that is, for clear expression of omissions, errors, faulty methods and redundancies in the course, with proposed measures for their correction. During the year these are welcomed, but they are most valuable if given in the light of prolonged experience and based on notes made during that experience.

Criticism and suggestion have every year been invited, received, welcomed and painstakingly reviewed. Some would not have been heard at all if the general purpose of the system of military education and the special missions of its various units had been kept in mind and if it had been possible to establish an even flow of students from one to the other, that is, if a uniform standard of matriculation had been required.

Formerly there was criticism of the expression of divergent views by individuals of the faculty. On questions of established principle and doctrine and of announced policy there should, of course, be no difference. On matters of execution and detail, opinions cannot be made uniform, nor should their expression and discussion be restricted so long as they are controlled and reasonable. It is the friendly friction of one informed mind against another that results in the common understanding essential to the best staff work. Specific instances of objectionable differences seem never to have been given so it may be that general statements have been based on incorrect grounds, or have arisen from a not unusual disposition of students to seek clearly formulated rules rather than to be satisfied with principles. No art, the military art least of all, can be follow d along precise lines.

As a result of the last course ten of the eighty students offered criticisms.

Five made observations that may be reduced to the following:

There have been,—

a. Vagueness, ambiguity, indefiniteness in setting forth tasks, problems:

b. Inexperience and ignorance on the part of committee chairmen;

c. Lack of time;

d. Too little assistance, guidance given to chairmen, individuals, committees;

resulting in.—

e. Loss of time;
f. Waste of effort;
g. Unsatisfactoriness of product, solutions;

and it is recommended that,—

h. Problems, directives, be more clear, definite, precise, positive;
i. Work be constructively guided;
k. The faculty be represented in committee meetings;
l. Closer relationship be established between faculty and students;
m. Doubtful questions be promptly decided;
n. Faculty members act as committee chairmen;
o. Parts of tasks be assinged to individuals by the faculty.

In every school it is found that students desire clearly stated rules and directives, precise, unmistakable. To comply with this wish would be to crystallize, to formalize, to fetter what is and should be a liberal art; to present, in a manner quite opposite to that of subjects arising naturally and largely dependent upon chance, and, therefore, in the wrong manner, problems which are intended to encourage analysis, rational consideration, independence, initiative and decision, and to develop right method.

The excellence of many solutions in every case indicates that the difficulties presented were not insuperable. No vagueness is intentionally introduced into any statements of problems. Conference with the director concerned is invited and will clear up any ambiguity.

The very purpose of assigning student chairmen is to give experience and training in subdivision of tasks, in assignment, supervision and coordination of work, and in study of men, by the applicatory system. This would be defeated by assignment of faculty members to chairmanships. The object is to learn principles and to develop methods of their application. The character of the resulting solution is important in determining the student's suitability for general staff work and for high command but the solution itself is not the main object.

Lack of time is a very serious difficulty felt by the whole College. Limit to the assistance and guidance that can be given has been imposed by lack of faculty personnel and of time compared with the field of work. The difficulty also arises in part from the defensive attitude adopted by many students who fail or refuse to accept the many times repeated invitation and encouragement to consult the faculty on their own initiative.

A greater number of individual problems will be given in the future; the faculty will also assist chairmen in dissecting problems and assignment of their parts; and changes have been made in the program of the course which it is hoped will result in better utilization of the time disposable.

Three thought that,—

a. Favoritism was shown in assignment of chairmanship, or at least that tasks have not been assigned equitably or by roster.

b. Committees made up of individuals whose desks are scattered find it difficult to work together.

Tasks of greatly varying difficulty are necessarily assigned; *students who have not done well or have been sick or absent have to be given renewed opportunities to succeed;* those whose suitability is doubtful or training deficient must receive repeated chances to learn. In some cases, particularly after superior chairmen or students with special talents have been discovered, it is desirable to make irregular assignments to ensure profitable presentation to the College in conference. An equitable division of work and responsibility is always sought. But learning is the purpose and test is incidental. A roster, not necessarily by seniority, is followed as closely as possible.

Reassignments to rooms will be made more frequently, based upon committee assignments so far as practicable.

The observations of four may be condensed into recommendations for accentuation of the Command feature of the course, for an arrangement of the various headquarters different from that adopted, for standardization of forms of reports and abandonment of the writing of orders, for localizing war games on ground that can be visited.

The past year has seen the command side of training greatly emphasized over previous years. It has been for some time decided that the time devoted to it shall be considerably increased. But the whole course is really a Command Course, divided into parts only that the time may be most economically used and that all students may cover all subjects.

Great saving of time results from conducting map maneuvers on the third floor. Communication installation and personnel are not available for the distribution of groups throughout the building. Great advantage is possible through the personal contacts imposed by the present method. The other has been used with less success. The remainder of the criticism hints a policy of perfection impossible of attainment because of the varied preparation of students, lack of funds, the necessity of making problems real. It indicates a demand for standardization, formalization, "rules of the game," inapplicable to most of the features of a map maneuver of a War Plan.

The point that orders and reports in the War Game should not be required is not well taken. It is true that practice in this work is not now a specific function of the institution. Commands should, however, operate as nearly as practicable as they do in war and this work forms an important part of the exercise of staff and command duties. The technique should be learned before coming to the War College

and the student should be able to handle this part of it without devoting an undue amount of his effort and attention.

Two commented on the "drudgery" of research, complaining of lack of lists of selected references and of inability to obtain all that were listed because others had drawn them from the library.

A very great amount of work has been done along the line suggested and is continuing. But there are warm opponents of the idea that a bibliography should be furnished the student and doubters as to whether the method is not too narrowing.

Judging from the lists of works consulted which have been submitted by students there was no great difficulty in obtaining references on the part of those who took full advantage of the library resources of the District as well as of those of the College.

Practice and training in research is important to the military student. He must learn how to use a library. If one knows how to do this he can conduct his own research with much less loss of time and energy than by having some one else do it for him. Much assistance in the way of references was given last year. Some students never produced anything beyond what was given them in references and did not well evaluate what they read. A list of references is too often taken as an approval of their contents.

Three adverted to the lecture course, one asking to have International Finance covered, one saying that unexpected intercalation of lectures interfered with work and one that the number should not be reduced.

It has been planned to devote more attention to the subject of Finance. Unexpected interpolation of lectures and conferences is doubtless disturbing. It is due generally to the necessity to consult lecturers and to accept dates suitable to them, occasionally to some unexpected contingency. Progress is being made in fitting lectures better to the course.

Conferences onone course during the period assigned to another are avoided where possible. However, the advantage of having the staff studies separated by periods of the command course is so great that the former must be interrupted at times by command conferences, either for the purpose of summarizing past work, or preparing for new portions of the command course. It is plainly impossible for the command section of the faculty to review the work of a war game over night and present the results before starting on another course, but the command conferences are held as soon after termination of a game as is practicable. One staff course was rather heavily hit by command conferences during the past year, but the net result to the students justified the action.

Four believed that the time available was too short, two of these saying that rules regarding attendance and departure are too strict.

Complete solutions of many problems are recognized to be impossible. Many problems are continuing ones, more and more developed from

year to year. Considering the field to be covered, many tasks can be but partially accomplished,—the amount of progress, the efficiency of the method and the creditability of the result being the measure of the student.

Upon rather frequent evening visits to the College it was seldom that students were found working. Since the course ended, inquiries of members of the last class have not indicated that they often had to take work away. There were some who habitually arrived earlier and departed late. There were two or three who overworked and worried. But the program is laid out to require only the hours allotted.

Presence is required at lectures and conferences. Absence at other times is authorized, upon registration, for any legitimate duty connected with the College. Report to the Executive Officer is required in other cases and Committee Chairmen or superiors in a map maneuver should also be consulted. The building is open, day and night, for use by faculty or students.

Six expressed as many opinions regarding the rating or grading system. The subject has been covered earlier in this paper.

Two suggested that visits to places such as Aberdeen Proving Grounds, Edgewood Arsenal, Watervliet Arsenal, Quartermaster Depots be made and that these be made at the beginning of the course. Considerations of the purpose of such visits and of time and money available must govern the action from year to year.

Two found fault with the rules for exercise and the methods of physical examination.

There were other scattering opinions, some in complete opposition to one another and some known to be opposed to a consensus.

But one said that "instructors should not be below the rank of colonel and preferably should be senior in grade to any student officers."

To accomplish this either the selection of instructors must be limited to a pool which would probably not contain the necessary available talent, or the detail of students must be such as to deny opportunity to those who rank the junior instructor. A third alternative would be to promote by selection. In the faculty itself assignments are made without regard to rank and without friction. So also in the course chairmen and commanders are assigned without regard to rank. If learning through guided study is the honest purpose of attendance the only fair complaint against instructors must rest on their fitness for their task.

In this paper the principal points that it has been attempted to make are,—

The College is one whole.

All are students, present to learn, not to teach.

The principles of selection, of competition and of test are authoritatively recognized in the school system.

Competition between individuals at The Army War College is entirely unnecessary. Aspiring industry to produce good work is all that is required for success.

The student will improve his own efficiency by giving generous assistance to others.

Just so long as it appears that the individual (and the Government) will profit by the course he will not be recommended for relief even though it be believed that he should not graduate.

There is a definite method of recording estimates of progress and of preparation of efficiency reports.

All decisions as to rating and efficiency are made by majority vote of the Faculty Board. In practice the full board is present.

The work is laid out to require the use of all the time available but there is no intention to require more.

It is necessary to give great attention to matters affecting health, good physical and mental condition.

The system of learning is applicatory.

The course is one continuing in a measure from year to year.

Relations with extra-Army society are advised. Politics and propaganda are discouraged.

Guides to research are the Directors, the Officer in Charge of the Library, the Librarian, the Director of the Historical Branch. It is better to resort to these at first than to browse about. Nearly all data, almost all sources are available in the building.

Criticism, accompanied by suggestion, is desired.

All assignments, with rare exception, will be made by roster, alphabetically in staff courses, by rank in the Command Course.

The Army War College is what has been described. Its future rests upon the support of broadminded officers. Probably in a very few years it will rest mainly with its graduates. In my conception, it is, or should become, a great institute at which the broader problems of national defense are studied and discussed, mainly with the object of learning the methods of investigation to correct conclusion, but secondarily with the view of producing useful conclusions.

It is, or should become, an institute at which a group of selected, mature officers meet and, with the officers of other departments of the government and the leaders of our industrial and political life, freely discuss the great problem of mobilizing the nation for war.

It must be evident to all that it is no longer an economic possibility for nations to keep standing armies, or navies or arsenals of sufficient size to insure their national defense.

It follows that the next war must be won by the state or group of states which can best and earliest adapt its peace-time structure to war use.

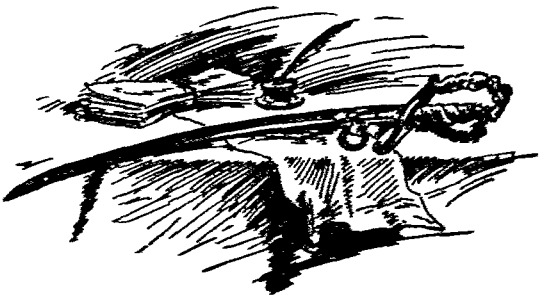
Knowledge of the peace-time structure and of the proper means to

give it military direction in war can not be had by *study of the problem in compartments*. The problem is one of the nation; of the Army; of the Navy; of the Department of Commerce; of Agriculture; of State; indeed of all the departments of the Government and of the leaders of industry and politics.

It is useless to urge that each of these should study the problem as a part of their day's work. They can not and will not, but they can gather together at the War College,—the military and naval officers for a year, the others for as much time as they can spare,—where, apart from daily routine, the best of their minds is given to the problem of the defense of the nation in which they believe.

The work of the College will never, in peace, result in the complete development of a war plan in all its details for the conduct of any particular war, but sound, general premises and conclusions should be evolved upon which any war plan to meet a particular emergency can readily be built *through familiarity with effective methods*.

Throughout this paper, it must have been noticed, the College has been considered as a whole. Between students and faculty there exist differences of power, duty and responsibility, to be sure. But at bottom the College is a community of mature men, gathered together for study and learning, with common interests and a simple aim,—the improvement of military education throughout the Nation that its honor may be upheld, the accomplishment of its destiny unimpeded, and its influence in the world's peace, happiness and progress strengthened. So these members of the College should be "all friends, each carrying out his duty with zeal and without either envy or jealousy," for comradeship is essential to effective work by a general staff and its chief.



War, Its Nature, Doctrines and Methods

By Lieut. Colonel Hjalmar Erickson, Field Artillery

Editor's Note.—In view of the noticeable similarity between certain passages in this paper and certain passages in Training Regulations, it should be stated that this paper was written in the Fall of 1921, and had its share in the formulation of Training Regulations.

I. RELATIONS OF MAN

BEFORE discussing the nature, doctrines and methods of war it may be interesting first, to consider man's progress and some means and methods which have been set up by him to overcome or reduce frictions which arise in his daily life.

Strictly speaking, man always has lived and always will live in a state of constant friction with his fellow man and with nature. His intelligence and power of adjustment generally remove or reduce friction without resort to physical violence. But at times, only violence can overcome it, and we, therefore, find in the history of mankind that his progress has been punctuated with periods of violence and warfare. War, then, in the sense of violence, has been since the earliest times, an instrument and a means of man for removing or overcoming serious friction in life or for obtaining for himself those things which he considered necessary or good for his existence.

At first these struggles were confined to individuals, and a single violent act probably terminated hostilities, but as man developed power of organization and co-operation war became more and more a continuing process made up of many separate hostile acts and all contributing to a common end.

Since the very beginning man has striven for greater security and comfort. He has had to battle with both nature and man for these, and has thus been compelled to develop within himself the will and ability to fight; and man's fighting power has been steadily increased by his intelligent use in or adaptation to war of things in nature.

II. CAUSES FOR WAR

In the last analysis of man's behavior, hunger appears to be the controlling factor, and the lack or insufficiency of food will continue to be the most powerful motive for violence and war. From the earliest time, man has aspired to secure for himself a dependable food supply, and the principal aspiration of modern nations is the accumulation of

resources, actual and potential, which will assure an adequate and unfailing food source for their people.

Over-population has in the past been a powerful and direct cause for war. Its pressure burst ancient borders resulting in the driving away, suppression or even extinction of weaker peoples. But as nations advanced and grew they adjusted themselves to new conditions with greater and greater facility, and increased populations were taken care of by directing them into activities of service, industry and trade. Thus trade routes and commerce developed, and those nations survived or waxed great who were best equipped by nature and attainment to accommodate themselves to these changing conditions.

While over-population in itself is no longer a probable direct cause for war, nevertheless, it is a powerful factor in the frictions and misunderstandings which lead to wars between nations, and is therefore an indirect cause for war demanding deep consideration. Success in industrialism brings about a rapid increase and congestion of populations; and congestion of population from all causes has continually forced peoples to seek territory to which the surplus population could migrate, or to seek resources with which to sustain their overpopulated areas. So, indirectly, over-population is still a possible cause for war.

III. ASPIRATIONS OF NATIONS

The history of a nation narrates, among other things, the hopes and aspirations of its people and the success or failure, with the causes thereof, that have attended the efforts of the people to accomplish these aspirations. A nation gives evidence in both its growth and decline of the peculiar characteristics of its people and the changes that come over them. From the earliest struggles of tribes for hunting and grazing lands on down to the struggles of modern nations is seen the thread of mass aspirations and success or failure in the accomplishment of them. In early times, these efforts, when successful, resulted in the expansion of borders and the conquest of weaker nations. Later, as commerce developed, trade routes and sea power excited the ambitions of nations. First the nations lying athwart the land routes from the Orient to Southern Europe rose and fell, then, as man became more bold and enterprising, the great maritime powers succeeded each other, because they controlled the sea routes, until today we see Great Britain mistress of the high seas. In turn, the age of industrialism caused increased trade, and the mineral resources of the world to become objects for which nations seek, and in this field Great Britain is also supreme, although we are her most dangerous competitor.

IV. NATIONAL POLICIES

The ambitions and aspirations of a nation crystalize into and find expression in national policies, and naturally where these cross with

those of other nations rivalry exists and differences arise. Modern nations may settle these in three ways, that is by:

a. Diplomacy.
b. Arbitration.
c. War.

The first two try to adjust differences by peaceful methods and means; the third, war, is the instrument used as a last resort to establish or continue a line of conduct or policy by violence. Wars, therefore, mark the epochs in the life of nations where national policies have been considered so vital and have been so strongly adhered to that the last resort to enforce or defend them has been called forth. It is natural, therefore, that the histories of nations have been called to a great extent the records of their wars.

V. NATURE OF WAR

War as a Government Instrument to Establish or Maintain Policies

Considering war as a Governmental instrument, used as a last resort to establish or continue a line of conduct or an expressed policy, it is the continuation of Diplomacy, or better, a supplement thereto; and a means for picking up a political question at the point where Diplomacy no longer can carry it alone, but must wholly or in part transfer it to the broad shoulders of War. Diplomacy and War, shade into each other; now one, now the other holds the center of the stage, according to their relative power and usefulness to the Government at the moment. They are both tools for the Government to use according to the nature of the tasks upon which it is engaged. But, considered as governmental tools, Diplomacy and War differ in the method, space and time of their application. True both plan in secrecy and execute to a certain extent under cover, disclosing only such things as are of no real import or which will mislead an opponent, but while one depends upon more or less sustained moral pressure to exhaust its opponent and gain its end, the other wins by violent physical blows, upsetting its opponent, and depriving him of both the means and the will to continue the struggle.

With arbitration, war has nothing in common, for the very theory of arbitration is based on *final* settlement of differences by cool reasoning from facts, and uninfluenced by either interest or fear. Arbitration is an instrument from without the Government. It is a means used by an outsider, not a party to the dispute in question, upon the invitation or concurrence of the interested parties. It, therefore, has no relation with either Diplomacy or War.

War as a Weapon of Defense

War and the means for war are also weapons which a prudent nation carries, upon the same principle as does an individual, i.e., as a de-

terrent to those of dishonest or predatory tendencies. As a weapon it should, therefore, be dependable and ready to hand.

War as a Science and Art

War as a science is the knowledge gathered from many sources and tested in the laboratories of the battlefields of the ages; as an art it is the application on the battlefield of the knowledge gained by study and practice.

War as a Social State

Finally, war is a social state between belligerent nations and is marked by the change from friendly intercourse and good will to hostile acts and hate.

Considering War as the instrument of last resort which a nation employs to impose its will upon another, it is a weapon not to be lightly drawn, nor one to be returned to the scabbard before the task which called it into use has been definitely completed. In the words of an ancient Chinese leader who fought some thousands of years ago: "Wars should be fought to a conclusion; it should never be necessary for two nations to fight twice over the same question." A drawn war, or a war "without victory," that we heard so much about in 1916, is merely a postponement of the final settlement of a question. Each side will look forward to "Der Tag." Therefore, Diplomacy must not be permitted to take the center of the stage too soon in war, even when the final victory seems assured, for it is thus that the fruits of military victory have been lost and questions fought over, reserved for decision on the battlefields of future days.

VI. CRUELTY IN WAR

War always has been and still is cruel. It is born in heat and passion and these emotions prevail throughout its duration. There can be no benevolence or good will towards an enemy in war. War means suffering, bloodshed, and death. The best we can do is to conduct it in accordance with modern usages and *with the least possible suffering for our own people.* This means just two things; first, that we must prosecute the war with all our might, so that it may be brought to a speedy and successful conclusion, and, second, that we must fight it in the enemy's country, so that our own people may be spared the horrors of hostile invasion. On principle, therefore, a nation should be prepared to prosecute any war with all its might and determination, for the use of partial means against or the exercise of benevolence toward the enemy will only bring partial results or an unnecessary prolongation of the war, and will thus certainly increase the loss of life, limb and treasure, and increase the suffering *of our own people.* Another reason for conducting war with all might and determination is to return the belligerents to the pursuit of peace as quickly as may be. No longer are wars conducted

by a portion of a nation's citizenry while the remainder pursue, more or less freely, their peace time vocations. Modern wars are nationalistic and are conducted on such a vast scale that *every* citizen is directly concerned. Industry largely changes the character of its products from constructive to destructive articles, trade is interrupted, neutral nations capture the world markets, while the belligerents spend their substance and pledge the means of unborn generations to meet the war expenses. Disorganization takes the place of organization and is far-reaching, and readjustment after war is exceedingly slow, as shown in the world today.

VII. PREPARATION FOR WAR

Our guide in studying a possible enemy should be *his* preparedness for war as far as it is known to us, and, if we desire to defeat him quickly, we must proportion our efforts to his power of resistance. As all people, all activities, and all resources of a nation are required for the prosecution of modern wars, if follows that plans in preparation for wars should be national in extent and character and that the military plans are only a part of the whole war plan of the nation.

VIII. DOCTRINES OF WAR

When a nation sees that its fixed policies are in conflict with those of another nation, and that a peaceful solution of the problem is rather hopeless, it studies the latter nation as a potential enemy and by estimating its own and the possible enemy's resources, including those of possible allies on both sides, it arrives at some conclusions how best it may utilize its military and economic resources should a state of war exist between it and its rival. Such conclusions form what may be termed its Doctrine of War under the conditions studied. If a nation be superior in force to another it may evolve a doctrine that will enable it to inflict a crushing defeat as quickly as possible. It was thus the German Doctrine of War with respect to France developed. It included the idea of envelopment, being therefore linear in character, whereas the Doctrine of War of a weaker antagonist, such as the French, appreciated the necessity for linear contact, with a mass of maneuver or strategic reserves to deliver vital strokes. Success in either case demanded the use of the offensive to gain victory, but this latter is one of the Principles of War which are unchanging and *not* a Doctrine of War *which is a theory of using a Nation's force under particular conditions.* A nation may, therefore, develop different Doctrines of War depending upon the the strength and character of possible enemy nations. A sound and practical Doctrine of War must conform to the Principles of War, and in the way the latter are applied to the Doctrine there results the necessity of training the armed forces in a particular manner. *The guiding principles of this particular method of training may be called the Doctrine of Training.*

For many years prior to the World War there were sufficient basic antagonisms for the various nations of Europe to formulate their Doctrines of War. But in our own country there was no such necessity and, therefore, the answer to our gropings for a Doctrine of War is that we did not have any for the simple reason that we had no probable antagonist in view. There was no country whose policies were in such conflict with our own that we needed to look to any other than a peaceful solution of our difficulties. As near as we can come to such a thing as a Doctrine, without assuming an enemy, is to search our history and see what might be expected by our people. First of all, our wars have been fought to a conclusion; that is, we have not had to fight a nation twice over the same question; second, with two exceptions, our wars have been fought on other territory than our own. It can be said that *our people will expect to fight future wars to definite conclusions and, other things being equal, to carry war into enemy countries so as to avoid hostile occupation of our own.*

Based on the above assumption, it appears that while we may some time develop a special Doctrine of War with some particular country or coalition, we must emphasize in our training the strategic and tactical offensive as a general principle. At the same time, we may be on the defensive in a political sense, for no one conceives that our country would enter upon a war of conquest and aggrandizement.

IX. DOCTRINE OF TRAINING

We have said above, that in the way in which the Principles of War are applied to the Doctrine of War of a nation there results the necessity of training the armed forces in a particular manner, and that the guiding principles of this particular method of training may be called the Doctrine of Training of the Nation. It follows, therefore, that the Doctrines of Training of one nation cannot be bodily adopted by another unless their Doctrines of War as well as other conditions are similar or identical. But, of course, one nation may adapt principles and methods of training of another to meet its own needs provided these modifications are acceptable to its national psychology and genius. We have all had unfortunate experiences in the late war in attempting to adopt bodily the principles and methods of training of foreign countries. Every nation or people possesses within itself certain characteristics so peculiarly its own that in war no two countries behave—I use the word in the sense of react—in the same manner. Similar external causes will set up different reactions in different nations as in different individuals. An appeal which will raise the Latins to great heights of exhaltation, and cause them to perform miracles of valor may leave the Anglo-Saxons quite cold and unresponsive, and even provoke contempt. Each nation must, therefore, make its methods of training and combat its own. This the Americans recognized very early in the World War as shown

in General Pershing's training instructions, dated August, 1917, which read in part a follows: "Trench warfare naturally gives prominence to the defensive as opposed to the offensive. To guard against this, the basis of instruction should be essentially the offensive both in spirit and in practice * * * the methods to be employed must remain or become distinctly our own."

We have said that the guiding principles of training may be called the doctrine thereof and that this doctrine must be in accord with the immutable Principles of War. These principles have been the subject for many writers, who have assigned to them different names as seemed best to them.

It is the belief of the writer that they cannot be too often mentioned, and they are therefore listed below.

PRINCIPLES OF WAR:

(a) *Those applying to both strategy and tactics.*

1. The Objective
2. The Offensive.
3. Superiority of Force.
4. Economy of Force.
5. Maneuver.
6. Security.
7. Surprise.
8. Team work.

(b) *Those applying to tactics only.*

1. Fire.
2. Shock.

The Principles of War are the basis for all training doctrines, and every arm or service concerned with the training of its personnel must see to it that nothing contrary to the Principles of War creeps into its training literature. In formulating training doctrines for arms and services it may be well to prefix their regulations and manuals with a statement of their fundamental doctrine or raison d'etre of the arm, as has been done in par. 1, Vol. I, "*Provisional Drill and Service Regulations for Field Artillery.*" These regulations were completed in 1916 and are unique among drill and service regulations for the statement in the very first paragraph of what may be called the basic doctrine of the arm. This statement reads as follows: "The reason for the existence of Field Artillery is its ability to assist the other arms, especially the Infantry, upon the field of battle.

The degree to which the Field Artillery prepares itself to render this assistance is, then, the measure of its training * * * ."

It might be well for all arms and services to place thus in the very beginning of their regulations the objective of their training. From a careful study of the special and drill regulations of all arms and services of our Military Establishment the following basic doctrines may be inferred:

Doctrines on Which Training is Based as They Now Exist and Govern

1. *All arms and services:*

To prepare for the offensive under open-warfare conditions, the aggressive, unrelaxing offensive is the only road to victory. To inculcate a broad spirit of cooperation.

2. *Infantry—the basic arm*

To inculcate an aggressive, self-reliant spirit; to close with the enemy, utilizing to the fullest extent its own fire power to reduce strong points and overcome resistance. Absence of auxiliary assistance does not justify diminution of aggressive effort.

3. *Cavalry*

To inculcate a spirit of energy, boldness, and audacity, and a willingness to accept chances against long odds; to utilize its particular characteristic, mobility, to advance the general plan by acting swiftly and by surprise. Mobility must not be sacrificed to fire power.

4. *Field Artillery*

To assist the other arms by fire, especially the infantry, upon the field of battle.

5. *Coast Artillery*

Fixed Defenses:—To develop a high degree of skill in the destruction of matériel by cannon and mine fire.

Mobile Artillery:—Same as the Field Artillery.

6. *Air Service*

To develop a bold and energetic combat branch; to give an efficient combat service to ground troops. Generally to aid and assist the other combat arms.

7. *Engineers*

To assist the arms and services; essentially by improving traffic facilities, and by increasing the defensive possibilities of the terrain. While trained for combat, such use is exceptional.

8. *Signal Corps*

To assist the arms and services by maintaining efficient and sufficient communications.

9. *Special Services*

To assist, each in its own sphere, the combat arms by furnishing supplies and services to maintain the armies in the field.

10. *Service Schools*

Doctrines as taught to conform to the above.

X. METHODS OF WAR

Methods of War are the ways and means for conducting war in conformity with the Principles of War, the nation's Doctrine of War and

its national characteristics, psychology and genius. The differences between nations in their methods of combat and war are due to differences in the human element which make up the nations. All civilized nations are practically equals in intelligence and in military knowledge, yet a Frenchman fights differently from a Portuguese, an American from an Englishman, etc. The North American Indian, because of his inherent inability to combine weak tribes into strong nations, always had to conserve manpower, and, therefore, developed a method of combat characterized by stealth and ambush. The early white settlers, because of their numerical weakness and great dispersion, adopted the same methods of combat. France, because of her inferior number and virility as compared to her traditional enemies: Germany and—perhaps —England, must conserve her manpower. She is, therefore, turning to mechanical devices for conserving this manpower and at the same time utilizing it to the greatest extent possible. The result of this doctrine is seen today in much artillery, many tanks, airplanes, and submarines, quite definitely indicating her future methods of war. So it is with the United States, and our future methods of war are, I think, indicated in the first paragraph of the doctrines quoted above:—"*The aggressive unrelaxing offensive on enemy territory.*"

ONE CAN NEVER PREDICT

HOW INVALUABLE THE EXPERIENCE GAINED IN THE MOST PETTY AND DISAGREEABLE DUTY MAY SOME TIME PROVE TO BE.

A Study on Organization and Training for Coast Artillery Troops

By Major Meade Wildrick, C. A. C.

PERHAPS no branch of the regular service faces greater changes in its post-war missions and material than the Coast Artillery Corps, or, more correctly speaking, the Heavy Artillery Corps, of the United States Army. Prior to the World War these troops manned the fixed harbor defenses in the United States and its outlying possessions, and, in addition to the primary training as Artillerymen, were given limited Infantry instruction. While every Coast Artilleryman takes great pride in the traditions and accomplishments of his Corps in the past, yet we must realize that today we face a far different problem from that which we had prior to 1917.

In the first place, the importance of the pre-war fixed harbor batteries has diminished greatly. This is due largely to the development during the World War of aeroplane bomb attack, aerial observation for long range naval and siege artillery, and the use of mobile heavy artillery in general. In recognition of this fact Coast Artillery troops have been assigned to modern armament and equipment.

In addition to the many problems resulting from the assignment to more modern armament, a still greater problem confronts the Coast Artillery and the Army at large in its mission. We are no longer an isolated unit of our military establishment, locked to a concrete emplacement and with an horizon limited to the range of the pre-war fixed battery mounted thereon, but are an integral and important part of the Army of the United States and share with the other combatant arms of the Regular Service the great responsibility incident thereto. This is an inspiring thought, and the question naturally arises in our minds: how can we best carry out this great mission?

In answering this question, first let us analyze our mission and the armament we have available to accomplish this mission and, second, determine therefrom the policies we should follow.

First. It is very important to get clearly in mind our mission, for it is necessarily the basis upon which we must mould our organization and training policies. Briefly, it may be stated as folllows:

(a) To provide Regular Units of Coast Artillery in time of peace, properly organized, trained and equipped, to man all types of armament

assigned to Coast Artillery personnel, and which will be available for instant service in case of war.

(b) To be so organized as to fit into the organization of the Army as a whole and to permit of rapid expansion in time of emergency, with the minimum loss of battle efficiency resulting therefrom.

(c) To train National Guard and Reserve Units of Coast Artillery in time of peace so that in an emergency these Units will be ready for field service in a minimum period of time.

(d) To develop in time of peace the tactical employment of all types of armament assigned, working in conjunction with the other combatant services of the Army, so that in time of war we will be able to use our armament to the greatest advantage.

(e) To develop the various types of armament assigned, including the accessory equipment, in conjunction with the technical services of the Army, so that Coast Artillery units will be equipped with modern armament at all times.

Having considered briefly our mission, let us analyze the various types of armament now assigned to the Coast Artillery, which are available to carry out this mission.

Fixed Armament. Fixed armament may be divided into two classes, pre-war and post-war batteries. In general, the former class consists of guns ranging from 3 inches to 14 inches in caliber, and 12-inch mortars. With the exception of the mortars and a few 6-inch and 12-inch guns, these weapons are mounted on a disappearing type carriage, with the resulting tactical deficiencies:

First. Limited elevation of the piece, resulting in short ranges, thereby being outranged by guns of equal caliber ashore or afloat, mounted on carriages permitting the use of higher elevations.

Second. Limited traverse (usually 170 degrees), which makes these weapons defenseless in themselves from attack outside their field of fire.

Third. Vulnerability from the air, as all batteries of this class were built before the development of aircraft and are practically impossible to conceal from the air, thereby being vulnerable to bomb attack and to aeroplane controlled artillery bombardment.

Fourth. Last and most important, this armament was emplaced to meet conditions of warfare long since changed, and bears on water and land approaches that today have little or no military value.

For the above reasons, a large portion of these batteries are now obsolete and do not warrant expending but a small proportion of our limited personnel on their maintenance during time of peace.

The post-war batteries, although few in number, are excellent, and correct the weaknesses of the old type batteries as given above, in so far as it is possible with fixed armament. They consist of guns of 12 to 16 inches in caliber, mounted on all round fire barbette carriages,

permitting the use of high elevations. These batteries will take but a small portion of our personnel to man.

Railway Artillery. As a result of the war we have on hand a number of different types of railway artillery. Of these the 12-inch railway mortar is available in considerable numbers, and is admirably adapted for both coast defense and land operations. This material presents an excellent opportunity for training purposes and should be used to its maximum capacity. It permits the employment of major caliber seacoast armament, in conjunction with the other combatant services of our Army, at practically all important points along our coast line.

Heavy Tractor Artillery. As in the case of railway artillery, we have available as a result of the war a number of types of heavy tractor artillery well adapted to our mission. Of these the 155 mm. G. P. F. gun is best known, as a result of its fine record during the war, and is best adapted for both coast defense and land warfare. During recent target practices in the Hawaiian Department by the 55th Artillery (C. A. C.), this weapon had demonstrated in a convincing manner its value for use against moving water targets, both by day and night. It represents an excellent replacement for our pre-war 3-inch and 6-inch fixed batteries, and permits the employment of minor caliber seacoast armament, in conjunction with the other arms of the service in coastal operations.

Anti-Aircraft Artillery. Prior to the war this type of armament was practically unknown in our service. Its development has been entrusted to the Coast Artillery, due, no doubt, to the fact that it was manned by Coast Artillery personnel during the war, and that the basic principles of fire control have many points in common with other types of Coast Artillery material. While the present equipment is not entirely satisfactory, it offers an excellent opportunity for training purposes until such time as better weapons can be developed. The responsibility of developing this service and training adequate personnel therefor is a serious one, for in war it will probably be the first type of artillery to be engaged, and it requires a high degree of training.

In addition to the types of material given above, the Coast Artillery has been entrusted with the development of the following additional equipment: heavy trench mortars, flash and sound ranging apparatus, and submarine mines. These activities, however, are less important and can be maintained in time of peace by a small training organization located at some advantageous point, such as The Coast Artillery Training Center. This will require in time of peace but a small quota of personnel and will insure, in case of emergency, a nucleus which can be expanded readily.

Having covered briefly the available armament in the preceding paragraphs, let us now determine what organization and training poli-

cies we should pursue, in order that we may fulfill our mission with the limited personnel available.

ORGANIZATION

As a proper organization is the fundamental basis upon which we must build, let us consider this question first. As previously pointed out, the armament assigned to us may be grouped in the four classes; fixed, railway, tractor, and anti-aircraft artillery. The responsibility of developing each class during time of peace is about of equal importance. For the purpose of coordinating questions of supply, personnel and training, all Coast Artillery units assigned to the above types of artillery should be organized on the same basis. What, then, should be our policies in determining the proper basis of organization?

First, as previously pointed out in discussing our mission, we should be so organized as to fit into the organization of the Army as a whole. In other words, we should speak the same language as the rest of the Army of which we are an integral part. Such terms as Districts, Coast Defenses, Battle Commands, Fire Commands, and Mine Commands, are foreign to the rest of the Army and should be discarded. They are unnecessary and cause infinite confusion and lack of understanding. They should be replaced by sound military terminology, such as Artillery Brigades, Artillery Groups, Regiments, Battalions, Batteries, et cetera. Thus, the 1st Coast Artillery District should be 1st Coast Artillery Brigade; the Coast Defenses of Boston should be the Coast Artillery Group of Boston; Regiments and Battalions should take the place of Battle Commands, Fire Commands, and Mine Commands. The word Defense as used in Coast Defense of Boston, is particularly objectionable, as it unconsciously inculcates in the minds of the personnel assigned thereto a spirit of immobility and sluggishness. It is suggestive of an acknowledged superiority of the enemy and should be replaced by a position in readiness for attack. An offensive spirit in military training is a prerequisite for success in battle.

Second, as pointed out in our mission, we should be so organized as to permit of rapid expansion in case of emergency with a minimum loss of battle efficiency resulting therefrom. This is a most important phase of the problem, as we all know by personal experience during the World War.

What should this organization be? There are many solutions to this problem, but it is believed that the simplest way, which incidentally is always the best, would be as follows:

The basic unit of all organizations of Coast Artillery troops in time of peace should be the Battalion, consisting normally of a Battalion Headquarters and Combat Train, and two or more batteries, depending on the armament to which assigned. These Battalions should be numbered serially from one up, as is now done for Field Artillery Regiments.

In time of emergency these Battalions could be expanded readily into Regiments, as the existing conditions required. This could be accomplished in several ways; by having the inactive units of the Regiment filled up, using the active Battalion as a nucleus; by assigning the inactive units to Reserve organizations; or by having the remaining units composed of National Guard organizations. The armament to which the Battalion is assigned should be indicated as at present; thus, 31st Artillery (Fixed), 41st Artillery (Ry), 44th Artillery (Tractor), 62nd Artillery (A. A.).

It will be noted under the proposed organization a Battalion assigned to fixed armament corresponds to a Fire Command under our present organization. Tables of Organization for such units would be based on the type battery to which assigned; thus, the personnel authorized for a 14-inch disappearing type battery would be different from that for a 16-inch barbette battery. In time of peace a Group Headquarters would correspond in general to a Regimental Headquarters under a war organization, or to a Coast Defense Headquarters under our present system.

In addition to the advantage of conforming to the organization of the rest of the Army and permitting of rapid expansion in time of emergency, the proposed organization, being based on the regimental and battalion formation, will increase greatly the esprit and morale of the troops. This is a fundamental truth which is well known to all students of military history. Moreover, it makes the basic organization independent of the armament to which it may be temporarily assigned.

TRAINING

Let us now consider the problem of training, with special reference to our mission. As previously pointed out, the responsibility of developing each type of armament assigned to the Coast Artillery and training personnel therefor, is about of equal importance. In case of war the element of time required to put combat units in the field is a primary consideration. This would dictate the necessity in time of peace of keeping an adequate nucleus for each type of artillery for which we are responsible. For this reason Coast Artillery personnel should be assigned to Fixed, Railway, Tractor, and Anti-Aircraft Artillery, in approximately equal proportions. Further, to distribute these units equally throughout the country for the purpose of training National Guard and Reserve Units, is a fundamentally sound policy. For this reason we should assign at least one unit of each of the above types of armament to each Corps Area.

In assigning the Battalions of Railway, Heavy Tractor, and Anti-Aircraft Artillery to each Corps Area under the above policy, Coast Artillery posts should be used whenever available. This, however, would be dependent on the existence of proper ground and training

facilities in the immediate vicinity. If practicable, these units should be concentrated to cut down overhead personnel. Thus, at one post there might be a battalion of Fixed Artillery and one or more battalions of Tractor, Railway or Anti-Aircraft Artillery. In certain Corps Areas embracing important water areas protected by satisfactory fixed armament, it would be advisable to assign more than one battalion of Fixed Artillery. On the other hand, in Corps Areas having no important water areas there would not be any battalion of fixed armament.

To coordinate the training of the Regular, National Guard and Reserve Units in each Corps Area assigned to the various types of armaments, there should be organized at each Corps Area Headquarters a Coast Artillery Brigade Headquarters with suitable staff. The personnel on this staff should include a Chief of Staff and a Coast Artillery line officer representing each of the four major sections of the General Staff. The training of the Coast Artillery officers assigned to this duty will result in excellent staff training, which would be invaluable in case of war.

In addition to coordinating the training and supply of the Regular, National Guard and Reserve Units of Coast Artillery, these officers would be available to prepare the war plans and intelligence studies for the use of these Units within the Corps Area in case of emergency.

Let us now consider our responsibilty as outlined in discussing our mission for furthering both the tactical employment and mechanical development of the various types of armament assigned us. While the Units assigned to the various Corps Areas will individually develop sound tactical principles in conjunction with the other combatant services in their annual manueuvers, yet we have in the Coast Artillery Training Center an excellent place to coordinate and standardize the principles so developed. There is ample ground at Fort Monroe, Fort Story, Camp Eustis, and the naval reservation at Yorktown, for experimental and training purposes. Moreover, with the Coast Artillery Board located at Fort Monroe to supervise the development of the technical problems encountered, we have an ideal organization to fulfill this important part of our mission.

CONCLUSION

Having discussed the problems of organization and training confronting us at the present time, and having determined certain policies therefrom, let us see how these policies apply under actual conditions. Assuming for the basis of this study an enlisted strength of three hundred men for each battalion, to include all Headquarters overhead, we get the following tabulation for the Continental United States shown on page 321.

While it is realized the following tabulation is academic and necessarily will have to be modified to fit local conditions, nevertheless it

outlines an organization for the Coast Artillery which is based on sound military principles and will permit us to perform our mission in case of war.

Corps Area	*C. A. Organizations*	*Enlisted Strength*
1st Corps Area	1st Coast Arty. Brigade	
	4 Battalions Fixed Arty.	1200
	1 Battalion Tractor Arty.	300
	1 Battalion Ry. Arty.	300
	1 Battalion A-A. Arty.	300 2100
2nd Corps Area	2nd Coast Arty. Brigade	
	4 Battalions Fixed Arty.	1200
	1 Battalion Tractor Arty.	300
	1 Battalion Ry. Arty.	300
	1 Battalion A-A. Arty.	300 2100
3rd Corps Area	3rd Coast Arty. Brigade	
Note: The units assigned to the 3rd Corps Area would be the C. A. Training Center troops.	2 Battalions Fixed Arty.	600
	2 Battalions Tractor Arty.	600
	2 Battalions Ry. Arty.	600
	1 Battalion A-A. Arty.	300 2100
4th Corps Area	4th Coast Arty. Brigade	
	1 Battalion Fixed Arty.	300
	1 Battalion Tractor Arty.	300
	1 Battalion Ry. Arty.	300
	1 Battalion A-A. Arty.	300 1200
5th Corps Area	5th Coast Arty. Brigade	
	1 Battalion Tractor Arty.	300
	1 Battalion Ry. Arty.	300
	1 Battalion A-A. Arty.	300 900
6th Corps Area	6th Coast Arty. Brigade	
	1 Battalion Tractor Arty.	300
	1 Battalion Ry. Arty.	300
	1 Battalion A-A. Arty.	300 900
7th Corps Area	7th Coast Arty. Brigade	
	1 Battalion Tractor Arty.	300
	1 Battalion Ry. Arty.	300
	1 Battalion A-A. Arty.	300 900
8th Corps Area	8th Coast Arty. Brigade	
	1 Battalion Fixed Arty.	300
	1 Battalion Tractor Arty.	300
	1 Battalion Ry. Arty.	300
	1 Battalion A-A. Arty.	300 1200
9th Corps Area	9th Coast Arty. Brigade	
	4 Battalions Fixed Arty.	1200
	1 Battalion Tractor Arty.	300
	1 Battalion Ry. Arty.	300
	1 Battalion A-A. Arty.	300 2100

Total, Continental United States, 45 Battalions, 13,500 Enlisted.

The 1922 Encampment of the Coast Artillery Virginia National Guard

By Captain M. N. Fisher, C. A. C., Va. N. G.

THE Virginia National Guard Coast Artillery Corps is organized into a unit similar to a regiment and designated the First Coast Defense Command, Virginia National Guard. The Commanding Officer is Colonel Marshall M. Milton of Richmond, Va., and the second in command is Lt. Col. Frank B. Varney of Lynchburg, Va. Both of these officers have enviable overseas records in the world war. Col. Milton was with the 60th. Regt. C. A. C. as a battery commander and later as a battalion commander. Lt. Col. Varney commanded, in the Rainbow Division, a company of Hdqrs., Train and Military Police which was originally organized by him as the 2nd. Co. C. A. C. Va. N. G.

The organization and locations of the command are briefly as follows:

Hdqrs. Company, Capt. Knapp, Richmond and Danville, Va.
Medical Detachment, Major Mercer, Roanoke, Va.
409th Company, Capt. Wood, Lynchburg, Va.
410th Company, Capt. Shannon, Gordonsville, Va.
411th Company, Capt. Stockdon, Richmond, Va.
412th Company, Capt. Roadcap, Clifton Forge, Va.
413th Company, Capt. Land, Buchanan, Va.
414th Company, Capt. Hoge, Christiansburg and Blacksburg, Va.
415th Company, Capt. Turlington, Chincoteague, Va.
416th Company, Capt. Parker, Roanoke, Va.

All of these companies have been organized considerably less than a year and some of them only a few months, consequently their first opportunity for training came with the camp of 1922 at Fort Monroe, Va.

An advance detail arrived at Fort Monroe, on Friday, July 28th for the purpose of making preliminary arrangements for quartering and feeding the command. Because of the assistance given by the officers who were to be instructors and of the cooperation from the regular garrison this proved to be a comparatively simple task. When the entire command, with the exception of one company, arrived on Sunday the 30th at Camp No. 2, the men found themselves comfortably quartered in screened, airy barracks which were equipped with comfortable beds, springs and mattresses. Excellent mess halls and adequate lavatory facilities within a few steps of the barracks went to make the camp thoroughly comfortable and complete in every detail.

An intensive course of instruction which emphasized artillery drill and other work not feasible in the home armories was begun promptly Monday morning. Nine o'clock office men and school boys accustomed

to the easy hours of the summer vacation turned out at reveille with good will and promptness. From 8:30 to 11:30 A. M., and from 1:00 to 4:30 P. M., Batteries Parrott, Eustis, Montgomery and Anderson were overrun by two companies each of mountaineers and inlanders prepared to study the guns from base rings to trunnions and the horizontal base systems from B′ to B″. Observers learned the location of and oriented their instruments on "Bug House Light," as some seafaring hillsman insisted on calling it, others pored over recoil systems and absorbed the fact that powder only burns. Azimuth, meteorological message, ballistic wind, and such terms rapidly became by-words. This order interspersed with infantry drill, formal guard mount, small arms firing and base-ball games continued until, under the earnest and patient tutelage of the regular army commissioned and non-commissioned instructors, the range and gun sections developed into smooth working machines. Interest was sustained and training was spurred on by the desire to reach a degree of proficiency to permit the scheduled service target practice to be held. This, however, did not prevent the development of a keen rivalry for the small arms trophy, a silver cup, which was won by the team representing the 414th Company; for the baseball cup won by the 410th Company; and for the efficiency trophy, a pennant presented by Colonel Milton, and won by the 412th Company. The pride of the organizations over having captured these trophies, particularly the efficiency pennant, bespeaks an admirable esprit de corps.

On Thursday, August 10th, shortly after 8:00 A. M. Battery Parrott began firing, followed promptly by Battery Eustis, which in turn was followed by Battery Montgomery in accordance with the announced schedule. By noon Montgomery had completed its quota of shots thus making a total number of thirty-two shots from three different batteries manned by six different companies. There was little, if any delay or interruption that could have been attributed to training or personnel, and the command justly feels a little proud of the accomplishment.

Battery Anderson fired twelve shots on Friday afternoon the 11th with excellent results. Governor Trinkle and a part of his staff, Adjutant General Sale of Virginia, Major General Bailey, commanding the Third Corps Area, and a part of his staff were interested observers at Anderson. These distinguished guests arrived at the Fort on the morning of the eleventh and following appropriate ceremonies, in which the regular garrison, the national guard and the citizens' military training camp participated, were entertained at lunch by the National Guard Officer's Mess.

The batteries were assigned as follows:

Parrott.....412th and 413th Companies
Eustis.....409th and 416th Companies
Montgomery....414th and 415th Companies
Anderson.....410th and 411th Companies

After making due allowance for what might be expected of the materiel it would be difficult to choose between the performances of the various companies.

Departure of the troops began at 4:00 P. M. Saturday and by 10:00 A. M., Sunday the 13th, entrainment was completed. The officers and men almost without exception felt that their encampment had been profitable and certainly it was pleasant. Every facility of the post was open to the National Guard and no effort was spared to produce the maximum results in the limited time allowed. The attitude of the regular army showed an enthusiastic accord with the policy expressed by General Pershing when he said:

"The military establishment of the United States consists of the Regular Army, the National Guard and the Organized Reserves. These components, welded together into an effective and harmonious whole, are destined to make our country eternally independent and secure."

And this command is not lacking in appreciation for such an attitude; from the spirit of welcome and interest of the Commanding Officer of the Coast Defenses down to the earnest and patient instruction of the lowest ranking non-commissioned officer. The battery commanders all attribute in large measure to Captains F. A. Hause, R. E. Phillips, and V. W. Hall and to Lieutenant L. A. Denson, the success attained on the various batteries.

It is our determination to go to Fort Monroe in 1923 with an organization that will begin where we left off in the artillery work and even ahead of where we left off in other phases of our work. We look forward to it with pleasure.

Constructive criticism being at all times in order it should be pointed out that the greatest handicap that the National Guard suffers is the impossibility of developing range sections to the point of proficiency to which gun sections can be developed in the fifteen days allowed for training. There are too many practical objections to lengthening the training period to make such a solution possible; but if the men cannot be brought to the equipment, the equipment can be brought to them, and therein lies an economical solution to the difficulty. If organizations were furnished telephones and a part of the portable material used in the horizontal base system, the companies would arrive at camp each year with range sections prepared to function with comparative efficiency within a few days. A study of such a plan, which space here does not permit, would reveal the fact that a surprisingly small amount of equipment would be sufficient to instruct a range section in the fundamentals which consumed so much time at this camp. The Virginia National Guard feels keenly the need of such equipment, and the results obtained at the first camp of instruction following its employment in the home armories would amply justify the cost of furnishing it.

The Training of Coast Artillery Signal Details

By Captain Chrystie McConnell, C. A. C. R. I. N. G.

IT is the purpose of this article to show, first, the importance of this work and secondly, a method of doing it.

The signal system of a heavy artillery regiment may well be compared with the nervous system of a man. It gets its impressions from the observation posts, or eyes, transmits them to the brain, or post of command, and after they have been digested, to the guns, or muscles. We all know that the strongest man is of no use to himself or to the world if he is a nervous wreck.

Without a well trained and courageous signal detail, a regiment is helpless. Its whole purpose is to inflict damage on the enemy, and unless the fire of the batteries can be directed, they are useless. This is evident to anyone who will stop to realize that in modern warfare the guns rarely if ever see the target they are firing upon.

The first step in training is in the organization of the regiment. It was a practice during the late war to make the Headquarters Company the dumping ground of the other batteries. In making up the Headquarters Company by details from other batteries, it was the habit of battery commanders to send the men they wished to get rid of to the former. As all the special details were made up from this company, it is easy to see that this short-sighted policy can only result in disaster. Men for special duty of any kind, which puts them "on their own" should be well above the average, mentally, and of real character, as they will often be put into situations that will require the exercise of judgment and mental courage.

The next step is to search out all radio operators or telegraphists that may be found. It makes no difference whether the man has other qualifications that may make him valuable in another place. This may seem as rather a strong statement, but it can be easily explained. The author has been a professional radio operator, and also an instructor in one of the largest radio schools in the country, and has only seen or heard of one case in which a person became a capable operator in less than four months of daily ten hour a day work. It is not possible to speed up the process by any method of intensive training, as the human nervous system is only capable of absorbing so much training in a given time. Attempts to do too much in this line will result in a nervous

breakdown that will only delay, and perhaps prevent further training. At best it will result in the man's "going stale."

Classes under competent men should be started at once, in order to save valuable time later. If men all start at the same time, the gun details, transportation and orientation details will be fully trained *at least six weeks* before the signal details will be able to go into the field.

Now let us sum up the situation as far as we have gone; first, the regimental signal system is of vital importance, second, the men comprising this detail should be of the best in every way, third, their training is long and arduous, and should be started at the very earliest moment. This could be helped by recruiting propaganda among the ranks of our amateur radio operators, nearly all of whom now believe that the navy is their only field of usefulness in time of war.

The next thing to be taken up is the method of training these men. For the average man, four hours a day of practice in receiving is enough.

More than this fatigues without teaching, unless the man is unusually fitted for the work. This practice is best given in periods of about thirty minutes each, divided up by short periods of sending practice. Sending is so easy in comparison with receiving, that this branch is often slighted, but the ability to send clearly and distinctly is of great importance.

Material sent by the instructor for practice in receiving should always be sent a little faster than the student can receive. If he is getting it all down correctly, he is not learning anything. About fifteen per cent of errors by the student indicates the right speed. As men get more proficient, they should be divided into classes according to their speed.

There is one point here of the utmost importance, and strict adherence to it will bring returns a thousandfold; never send "straight press" or any connected language. Either send "code," a language unknown to the student, or send English backwards, beginning at the foot of the page and working up. If this is not done, the student will acquire a habit of guessing at what is coming, writing it down and then having to correct. This habit is the plague that ruins the speed and efficiency of nearly all operators and takes years to overcome.

The training in theory should be made as small as possible. The theory of radio telegraphy is complicated and technical to a very high degree, and unless the man, or officer, has had previous training as an electrical engineer it is a waste of time to try to teach him. The need of any elementary training can be obviated by selecting the men in the first place from those who have had some electrical experience in civil life. An intelligent use of the personal qualification cards will be a great help in this. The idea underlying this whole question is that of re-directing men who are already trained to some extent, and not educating green men. An example of wasted effort was very plain in one regiment in the late war. There was one man who had been head re-

pair and trouble man for a telephone company for some years, of great force of character, in fact an ideal officer. He could have been given his warrant as master electrician at once, and put to work at the duties of his rank, as he had served two enlistemnts in the C. A. C. N. G. Here was a man such as five years of service and a course at the Enlisted Specialists School could hardly produce. He spent his whole time in France as a sergeant in the Supply Company.

The most valuable part of the training is that which is given in the field. This consists in connecting up actual battery positions, or at least simulated ones. This latter is of especial benefit, as a battery commander coming into position, and finding that all the lines have been run, and that he can be in continuous touch with the whole army system at all times, has a great load taken from his shoulders. This part of the instruction is comparatively easy to teach, the difficult, and most important part is to teach the men quickly to locate and repair troubles on the lines.

The best time to teach this is at night, when the movements of the instructors cannot be seen. Wires should be cut, broken inside the insulation, wet, grounded, crossed, and any and all other things that the ingenuity of the instructor can suggest. When the men have become thoroughly proficient at this, the whole thing should be gone over again in gas masks. It is surprising how an apparently well trained detail will go to pieces at first under this handicap.

The next thing to take up after this general discussion of the training, is the actual tactical method employed. This includes the arrangement of the incoming and outgoing wires at the switchboards, the number of men in each detail, and their duties under all conditions. There are two classes of lines, fire-control and intelligence. Except in emergency each kind of traffic should be kept on its own line.

So far we have spoken of the preliminary training of the signal detachments, now let us take up in detail the actual connecting up of a regiment of heavy artillery. This will be shown in the diagram up to the battalion only, as by substituting regiment for battalion, the same scheme holds good for higher units.

First we will take up what we wish to do, and the method of doing it. After this we will deal with the personnel needed to do this work. The reader should pay close attention to Plate I, preferably learning it by heart, as the rest of the discussion to follow is only put in to explain this plate, and the methods used in arriving at the results shown.

Note that line No. 1 in all cases goes to the next lower unit that is lowest in number; for instance, in the battery exchanges it goes to gun section No. 1, in battalion exchanges it goes to Battery A.

Line No. 2 runs to the lower unit of higher number, Section 2, Battery B, etc.

Line No. 3 in all cases goes to the P. C. of the unit in question.

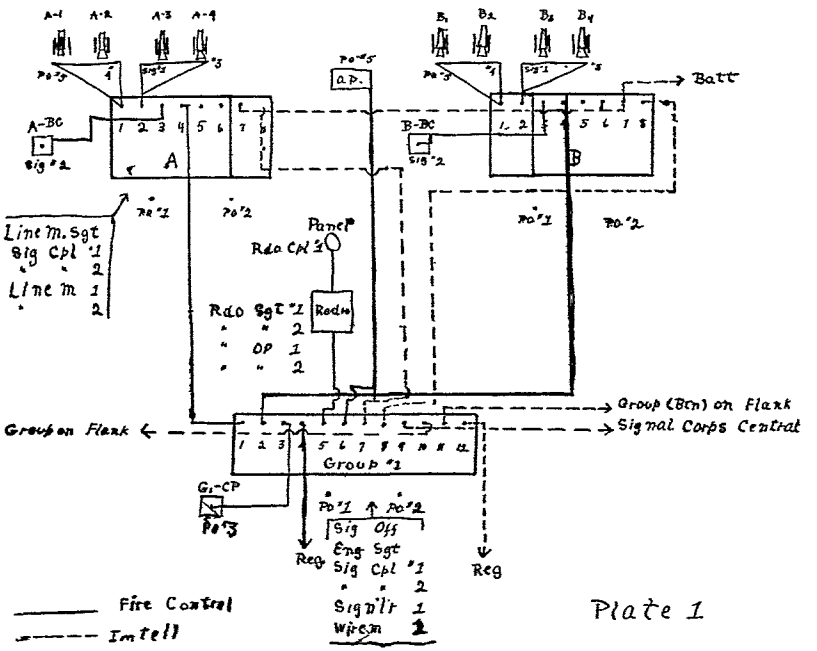
Battalion line No. 5 goes to the radio and panel station. Battery line No. 5 is a spare.

Battalion line No. 6 goes to the O. P.

The above lines are all fire control lines, and are run in the manner stated, without any regard as to the actual geographical position of the units. Battery A might be on the left of Battery B, but all connections would be changed.

We will now take up the intelligence lines. These start at the extreme right of the board, and work toward the left.

The right hand line goes to the next higher unit, this is line No. 12 of the battalion to No. 8 of the battery.



The next line, Btn No. 11 or Bat. No. 7, goes to the equal unit on the geographical right.

Btn. No. 10 or Bat. 6 goes to equal unit on the geographical left.

Btn. and Reg. No. 9 run to the nearest Signal Corps Central. This line should be left vacant if there is no S. C. central available, as this state of affairs is not likely to be of long duration, and having a place ready for this line may mean getting the connection ahead of some unprepared unit.

Btn No. 8 goes to the next lower unit on the right.

Btn No. 7 goes to the next lower unit on the left.

All lines are run from the top down, and fire control lines are of course run first. Lines between equal units can be run by mutual arrangement.

Notice that the gun telephone lines are looped, so that they can be cut in two at any point without affecting traffic in any way.

Let us now follow a call through in detail, remembering at all times that to use the word "Hello" will call for discipline for the offender. Assume that the battalion commander wishes to consult with his two battery commanders, and wishes each of them to hear what the other has to say. The battalion is "in observation," and all plugs are pulled out.

Example No. 1

Btn. Comm.	Phone Op. 3	G* Central	A Cent	B Cent	A-BC	B-BC
A BC, B BC	Rings G	G 1	. . . . .			. . . .
. . . . .	A-BC B-BC	A-BC B-BC		. . . . .		. . . .
. . . . .		1 rings A	A			
		2 rings B		B		
. . . . .	. . . . .	1 A BC	A rings BC	. . . .	A-BC	. . . .
		2 B BC	. . . . .	B rings BC		B-BC
	Ready, Sir					

* G = Group or Btn.

The three parties are now on one line, what one says can be heard by either of the other two. When through talking, do not forget to ring off. A double call such as the one described can be put through in less than ten seconds. Assume that the Battalion Commander wishes to speak to the gun commander of No. 3 gun of Battery B.

Example No. 2

Btn. Com.	P.O. No. 3	G 1	B cent	B 3
B 3*	Rings G 1	G 1	. . . . .	. . . . .
. . . . .	B 3	B 3 rings B	B	. . . . .
. . . . .	. . . . .	B 3	B 3 rings B 3	B 3
. . . . .	Ready, Sir			

* B 3 = Gun No. 3, Batt. B.

To get ready for a shoot, or for purposes of drill and instruction, the unit commander commands "Fire Control problem, all lines," or designates the lines that are to be used. This order is relayed by the centrals, all lines are connected together, and every operator has his phone to his ear. This latter is important, as after this command no rings are given. Another point to watch is the "Talking Buttons" on the phones should *not* be pressed. If they are, a perfect din of foreign noises will result. When the lines are connected this way every phone in the battalion can hear what is said, therefore only one person at a time can talk. To call any party, press the talking button, and call the designation of the party desired. All the others will hear, but maintain silence while the party called answers.

To make this system work properly, and it does so work, by actual test and experience, requires *discipline,* not only for men, but for officers. The signal officer should be in supreme command, and given authority to cut off or correct anyone of no matter what rank that is not complying with the rules. Even if this authority is not given to him, a

Table 2. Battalion Hedaquarters. Same for Regiment.

	Tel.	Commands	Observation	Action	Changing Station
Signal Officer	yes	Signal Detachments	Radio Sta.	Btn. C. P.	Supervisory
Engineer Sgt.	yes	Telephone Men	Btn. Central	Btn. Central	Supervisory
Signal Cpl No. 1	yes	Line Gang Charge of property	Btn. Central and Trouble Shooting	Btn. Central and Line	Runs line to A Batt.
Signal Cpl No. 2	yes	Line Gang	Btn. Central and Trouble Shooting	Btn. Central and Line	Runs line to B Batt.
Phone Operator No. 1	yes	.....	Btn. Board	Btn. Board	Installs Btn. Board
Phone Operator No. 2	yes	.....	Btn. Board	Btn. Board	Installs Btn. Board
Phone Operator No. 3	yes	.....	Btn. C. P.	Btn. C. P.	Installs Btn. C. P. Line
Phone Operator No. 4	yes	.....	Radio Station	Radio St.	Runs line to Radio
Phone Operator No. 5	yes	.....	Observation Post	O. P.	Runs O. P. Line
Wireman	yes	Line Material	Btn. Central	Btn. Central	Under Sig. Cpl. No. 1 Runs line to A Batt.
Signaller	yes	Line Material	Btn. Central	Btn. Central	Under Sig. Cpl. No. 2 Runs line to B Batt.
Radio Sgt. No. 1	no	Radio Set	Radio Sta.	Radio Sta.	Sets up Sta.
Radio Sgt. No. 2	no	Same	Same	Same	Same
Radio Cpl.	no	Panel Det.	Panel Sta.	Panel Sta.	Same, and Panel Station
Radio Operator No. 1	yes	Under Radio Sgt.	Panel or Radio	Sta. as Rdo. Sgt.	thinks best.
Radio Operator No. 2	no				

1 Officer, 15 men, 12 phones.

Table 3. Battery Detail

Lineman Sgt.	yes	Batt. Telephone Det.	Btn. Central	Btn. Central	Supervisory
Sig. Cpl. No. 1	yes	Line Gang and Property	Btn. Central or trouble shooting	Btn. Central or on Line	Run lines down from Btn Central to Battery Central Travels with Btn until wires are run.
Sig. Cpl. No. 2	yes	Line Gang	same as above	Same as above	
Phone Operator No. 1	yes	.....	Battery Switchboard	Battery Swb	Install Battery Board
Phone Operator No. 2	yes	.....	Gun No. 4	Gun No. 4	Runs Sec 2 Line with Sig. 1
Phone Operator No. 3	yes	.....	Gun No. 2	Gun No. 2	Runs Sec. 1 Line with Sig. 5.
Phone Operator No. 4	yes	.....	Gun No. 1	Gun No. 1	Runs Sec. 1 Line with Sig. 4
Phone Operator No. 5	yes	.....			
Lineman No. 1	yes	.....		Batt Central and Line	Under Sig. when running lines from Btn. to Batt.
Signalman No. 2	yes	.....	and trouble shooting san		
Signalman No. 1	yes	.....	Gun No. 3	Gun No. 3	Runs Gun Sec. No. 2 line with No. 3 P. O.
Lineman No. 2	yes	.....	B. C. Station		Runs B. C. Line

12 men, 12 phones.

system of diplomatic delays to those who offend, and quick service to those who co-operate, will in all cases bring a betterment of conditions.

If a battery commander has made the Headquarters Company the dumping ground for his undesirables, now is the time for revenge; put these men on the lines that serve their former battery, and when the commander complains of the service, as he will, tell him why it is bad. One would be surprised how quickly he will arrange to transfer some good competent men.

Tables 2 and 3, page 330, show the men and their duties for running this system.

THE FOUR-FLUSHER

OFTEN MAKES A NOISE LIKE A MILLION DOLLARS.

NEVERTHELESS HE IS A SELF-NOMINATED CANDIDATE FOR THE CLASS B SOCIETY.

On the Firing Line of the Industrial Sector

By J. A. Morford

Editor's Note: Mr Morford is an authority on industrial management and the problems which confront the employer of both trained and untrained men. He makes clear the feelings of an employer towards army officers seeking civil pursuits and emphasises just what is required of the ex-service man in order that he make good. We are pleased to announce that this is an original article written especially for the *Coast Artillery Journal.* Mr. Morford for several years managed the employment department of the National Carbon and Carbide Company until he was recently called to Long Island City N. Y. to adjust the employment problems of the Loose-Wiles Biscuit Company.

HEN, in the course of our National History, the time came for our preparation and participation in that dark period, the World War—when every resource was drawn upon to an extent beyond anything we had experienced in our former times of national stress—when every fiber of our economic life thrilled and trembled with action demanded of it, and the rapid assimilation of our raw products into a smooth, pliable whole was absolutely essential to the accomplishment of our purpose—while problems undreamed of were constantly demanding solution, no greater problem faced us than that of appraising our practically untouched reserve man power. The task was beyond, and far more complicated than the determination of the character of this great personel; the big problem—the real problem—and the vital problem was the rapidity with which these men must be fitted to the jobs, which the complicated business of war and the means of keeping that great business moving smoothly demanded.

Standards had to be set, the time for study and determination of the "efficient standard" was short; theory and observation of the best and most practical experience of our past, and Europe's lessons contributed their part, but in the main our plan of standardization in the correct selection of the man for the place was yet to be worked—it was still a problem; the electrician, the machinist, the millright, the doctor, the dentist, the nurse, the engineer and the skilled artisan were material ready for the builders' hands; but what was to be done with the banker, the lawyer, the accountant, the clerk, the teacher and the legion of untrained, unskilled material that offered much in possibilities and so very little in practical application?

That question was answered by a system so developed that, perhaps

for the first time in the building of a vast fighting machine, the units were selected, not because of the political or financial power behind them, but because of their real fitness for the task they were selected to undertake—a survival of test standards that proved their right to hold and take their place in the great mechanism,—fitted so that failure to act as expected was reduced to a minimum. How well the use of this master fitting stood for efficiency and accomplishment in the final analysis is spread upon the pages of the story of our achievements. How splendidly the work was planned and carried on by those entrusted with the colossal task of sifting and assimilating is recorded in the individual development and the mass efficiency in all branches of the army business. And so, in stress and need, was brought about a personnel trained and fitted to undertake a great task, but one which had for its goal the breaking up of the finely trained personnel as soon as the one problem—Victory—was brought about. The end was an assured fact—a certainty beyond question. War could not always be the occupation of all these units, and yet the infinite pains and effort put forth to make them supreme in their temporary work was not for a moment questioned—it would have been suicidal to have done so—and no thought of changing the fit for the unfit by eliminating the sifting process was considered in the scheme of things, despite the ever increasing pressure and call for fresh units and still more units.

With the end of the war came the adjustment period. The task had been accomplished, and the thousands of trained units, which had been so carefully prepared for the one problem, were withdrawn from the sectors of France, and sent back to that great field of unceasing effort and endless problems—the Industrial Sector.

In that great movement men who had been unequal to their work, and had measured up as weaklings before the war, found themselves—became real fighters—and made their place on the industrial firing line and maintained it. It was also true that men who had measured up as strong industrial units returned to their work unequal to the activities that they had formerly accomplished so easily, and sought to fit a place to themselves which might carry with it the authority, and the acknowlegdement of it, that they had gained in their army experience. Big American Business has been held up to frequent criticism because of its lack of consideration for the individual and its seeming failure to permit sentiment to play any part in its plans and activities; that such an attitude is hardly a fair characteristic is amply proven in the rapidly developing consideration of the question of Industrial Relations and Personnel Welfare, which so many of our large industries are finding it desirable to undertake through the means of large and many times generous budgets devoted to the building of a healthy, practical sentimental side which is none the less so because of its reaction in the making of a better and more productive working unit.

When the Industrial Staffs were called upon to re-absorb the man who had come back from "Over There" they did it well. They, too, had been learning lessons—lessons which had changed their attitude toward female labor, toward man power, toward production methods and toward many problems which they had hesitated to approach before, but which necessity had compelled them to adopt, and which they found in the adopting were of great value.

So they met their former employees frankly and readily, but with a proviso—and it should be thoroughly understood that this proviso was in no sense a lack of sentiment, of patriotism, or of appreciation of the work that their men had accomplished "Over There"; rather it was practical common sense applied to a difficult problem—that their men should *fit themselves* to the work in the new sector, and not expect or believe that the job should be fitted to them. This of course did not apply to those suffering from the effects of wounds or other incapacitating handicaps.

So the example of the Captain being subordinated to his Lieutenant, and the Lieutenant to his Sergeant was of sufficiently frequent occurrence in the industrial field to become a joke, and even reached the point of tragedy in many cases. But even as the private, a pianist of brilliant achievement was subordinated to a former pupil—his captain—and took his place in the sectors of the World War without the plea of unfairness or lack of sentiment being considered for a moment, so the Industrial Sector required the same absorption, and was sorely tried when the returning unit, on the plea of service rendered to country and prowess in military training, demanded that his case should be considered from that standpoint, rather than from the worth of himself as an efficient industrial unit.

He was absolutely sincere in his belief in himself, in his worth, in his ability to fill the place he had selected as best suiting his experience and development, looking at the entire matter from an angle prejudiced by his own premature conclusions, and in just so far he failed to sense the change in the industrial sector, and became, through this inability to fit himself into the new scheme of things an industrial casualty.

While the sectors of France had periods of practical cessation of hostilities when the opportunity came for relief and the fighting unit had moments of relaxation, the industrial sector offers no such relief. From the moment the decision is made to go into the firing line of industry the price of existence is the everlasting concentration on the problem by the staff, and the finger constantly on the trigger for those of lesser rank, if any degree of success is to be hoped for. And undoubtedly the greatest number of industrial casualties are due to the desire to "let up" in a greater or lesser degree in the effort to stick everlastingly to one's post.

Changes are rather the rule than the exception at the industrial front, and so a virtue of exceeding value is found in the unit who can claim long service with corresponding progress; but changes often come about through no fault or unfitness of the individual, and while he may be well trained for a specific duty, and his worth be unquestioned in that field, yet he may find great difficulty in finding himself so advantageously placed again, and so be compelled to meet new problems and fit himself to them rapidly and effectively, without retrospective musings or regrets, else he may find disfavor and disaster in the consideration of his superiors; and it is a well established fact, where a man may advance himself in no small measure in professional lines by the very act of remaining for long periods in his chosen field, in the industrial ranks—despite the virtue attached to long service, unless he has ability to fit well and accomplish real and worthwhile progress—he is apt to be classed as an "old faithful," and his reward more than likely will be that of a charity ward, while his co-worker of much shorter service, but who has solved his problems by efficient assimilation goes forward in leaps and bounds.

The Industrial Sector offers to the unit who finds himself, success and reward so attractive and alluring that each year brings to the ranks of the recruits many able and perfectly trained men, who go into action with unbounded assurance and belief in their ultimate success, and yet it is one of the most deplorable of casualties to find these well equipped, efficient, enthusiastic additions at times unequal to their task because of their failure to relinquish old ideals and systems of action which they try so hard to maintain and to force into the new environment which they have not given the time or thought to understand.

No question of their technical fitness is raised, no question of their mental equipment is concerned, and yet how many times is the comment made "Jones is one fine fellow, knows his job from A to Z—*but* he don't seem to fit in" and in that "but" is the fatal weakness that sends him down to a broken, disappointed, and sometimes tragic end.

When, through whatever reason, the soldier determines upon an active industrial career, and when that soldier has been especially picked and trained to command, he has behind him all the advantages of power and prestige of discipline and absolute obedience. He has been concerned but little with the wishes, attitude or reaction of his subordinates, and has found ample possibilities of adequate punishment for those who will not fulfill his commands. His problems and the method of solving them promptly, and in accordance with his plans, concerned him most; his position, his dignity and his right were quite unquestioned, and so he found a ready man power to his hand.

When he steps into the firing line of Industry, however, he must solve a new problem: that of his man power, his personnel. No longer can he meet it as his training has taught him it should be met. His

subordinate personnel accept him at his true worth as a man. Prestige, discipline, dignity may be won, and respect and even frank admiration follow, but he wins it because of his own ability to bring it about, and not because of the support of tradition or organization.

Should the mistake be made of attempting to bring about the old methods of the soldier which helped him in his army experience to master personnel—the industrial private will soon take the matter in his own hands, and will not use either tact or delicacy in expressing his attitude by word of mouth and by his absolute failure to function as a producing unit. He will make it quite clear and emphatic that he will in no wise be driven, nor will he give one jot of his vested rights as a free agent, and the very background of the military office in his chief's experience will cause him to constantly be on the lookout for trouble.

On the other hand it is equally probable that the army training, with all its careful preparations, may find itself subordinated to the training of the shop, the mill, the commercial house—and it requires the fullest self control and a call upon all the lessons of obedience and self restraint to successfully meet the many petty problems of personal difficulties that are bound to present themselves.

Self made work managers and superintendents are often very jealous of their hard won places, and are constantly alive to the fact that they are retained only through their intimate knowledge of the intricacies of the product manufactured and the method which reflects best the policy of their chiefs. The new man, of perhaps higher social plane, of greater intellectual attainments, and on edge to make himself felt in the industrial action, is viewed with mingled feelings of suspicion, distrust or envy by the superintendent or works manager of the plant to which the trained man has been assigned as a subordinate. Both appraise each other rapidly, and the outcome depends in a great measure upon the ability of the subordinate to fit himself by self effacement in supporting the chief whose knowledge of many things he feels is inferior to his own; yet his reward is there, and he can attain his goal by tactful acceptance of his place in the scheme of things, maintaining a discreet and honorable independence of thought and action, never offering as a reason for recognition or consideration his former authority through organization or custom. His way will not be hampered by system organization or prestige as he formerly knew it, and he may outrank rapidly, if his problem has been well considered and efficiently met—keeping well in mind that a failure to openly acknowledge his former training or ability in no wise indicates that his superintendent is unaware of them. It is the difficulty with which he gains the confidence of the works manager that expresses only too clearly that he, the soldier, has been correctly appraised, and if the reserve continues, it is equally to be admitted that he is very likely, considered a progressive factor by the staff.

Chiefs of the Industrial Sector are trained in their particular lines, and are successful in just that ratio; if the recruit is a real expert in some phase of the industrial requirement somewhat removed from the specific line he has taken up, it will be well indeed if he can forget for the time that such is the case, or if not, make the change to that work in which he will be able to voice his experience. It is a vital truth in the Industrial World that the successful wrench maker knows wrenches to the exclusion of everything aside from wrenches—that the successful paint maker knows paint from every angle, but has little time to discuss wrenches; nor has the wrench man much interest in, or sympathy with the paint maker's problems; so the recruit can find little sympathy, and few listeners to his story of his ability and prowess in a field aside from that with which he is identified. The old story of the college man seeking a connection who approached his prospective employer with the assurance of his ability in all directions—a "Jack of all trades" —as against the too ignorant Bohemian buffer who stated bluntly "Give me buff job, and I want set 'em down". The Bohemian goes to work. The "I can do anthing" man, despite his collegiate training, does not. So it is absolutely essential to select your place in the line, and then fit yourself to it. Our great Army School on the Hudson River turns out men who are amply equal to most of the big Industrial problems, but when they choose to turn to civil life, later on when these men have gained by experience and the broader contact with the world the lessons which are so necessary to an intelligent understanding of their fellow men, they may feel the call of the industrial side, or uncontrollable circumstances may turn their faces in the direction of civil work, they will bring to their new field all that careful education and training can develop; they will bring brilliant, receptive and powerful mentalities for the new undertaking. And yet, unless a study of the problems, from the point of view on the Industrial Sector is made earnestly and with the fullest intention of being absorbed and accepting them without attempting a miraculous cure until at least the correct estimate has been made of their potentialities, little is to be hoped for in progress or success.

But if the approach is made, as in the great majority of cases it is, with a full determination to know, to accept, and to master the new environment, no warmer welcome will be extended the recruit anywhere, and he can find no greater measure of success and happiness than will be offered him on the Firing Line of the Industrial Sector.

It is our purpose to treat of this subject from two points of view, one that of the *recruit to industry*, and the other that of the *industrial veteran*. An appreciation of one phase is quite impossible without an understanding of the other and as this sketch is but a preamble, to the real subject matter and in its consideration in it is obviously impossible to do more than touch the very high spots.

A Range Corrector

By Major Paul D. Bunker, C. A. C., (D. O. L.)

NOW here is a little gadget which should be in every home—I mean plotting room. It is small and inexpensive, if your don't have to make or buy it yourself, and helps out the plotter like a brother should—but doesn't. By using this simple device you can tame the wildest 110° Plotting Board so that it will sit up and beg. It is so good, in fact, that I must hurridly admit that the idea is not original. 'Way back yonder in the dim ages of our first Whistler-Hearn boards they had an attachment which worked on about this same principle. But of course it was crude when compared to this product of genius under discussion.

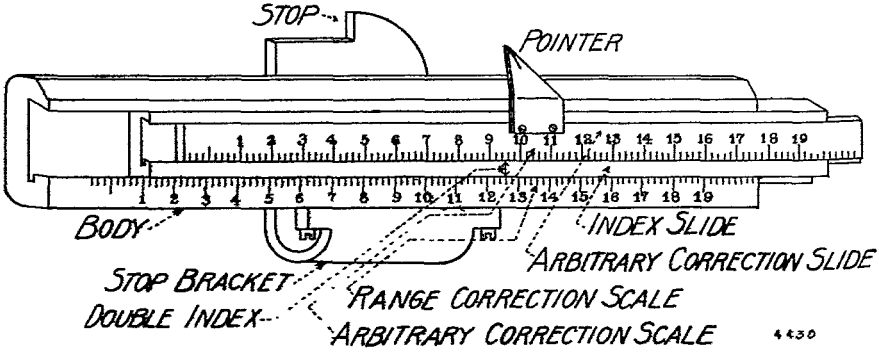


FIG. 1.

After which modest introductory, let us see what the thing looks like. First there is the "body," a piece of brass which is tooled to slide easily in the groove of the gun arm (110° board only). The "stop-bracket" screwed to the back of this body curves underneath the gun arm, presses lightly against its lower surface and so keeps the device in position. The tip of this stop-bracket projects beyond the fiducial edge of the gun arm and is cut away on one side perpendicularly to the gun arm. This edge forms the "stop"; the other side of this tip is cut on a curve to prevent its use through inadvertence. The "range correction scale" is placed on the body as shown in Fig. 1, with the "10"-mark exactly opposite or in line with the "stop". For obvious reasons both scales are graduated from end to end, instead of plus and minus both ways from the normal or "10" graduation.

This body is grooved, and fitting in this groove is another piece of brass carrying a double index. Let us therefore call it the "index slide." In the body, under the index slide is a flat spring which presses against the latter and is supposed to act as a sort of friction brake to prevent accidental movements of the slide. It would improve things if this spring were discarded and a quick, positive clamp were used instead.

The "index slide" is grooved also, and in this groove moves the "pointer slide" or "arbitrary correction slide," whichever you prefer to call it. There is a friction spring acting on this slide just as in the other case and for the same reasons as before it should be superseded by a clamp. The two edges of each slide are of different shapes in order to prevent the device being assembled in the wrong way. The "pointer" is screwed to the smallest slide; it is bent so as to lie flat on the upper inclined surface of the gun arm; its tip is in line with the 10 mark of the arbitrary correction scale and reaches just to the tops of the smallest graduations of the gun arm. It follows from what we have said, that when the double index reads 10 on both scales, the pointer is exactly opposite the stop.

So it is evident that this whole device is merely a simple type of adding machine. Setting off a correction on one or both slides must of necessity displace the pointer by an amount equal to the algebraic sum of these corrections. Then, if the "body" is slid along the gun arm until the "stop" is opposite the uncorrected range, then the pointer will indicate the corrected range. It is easy to set the stop at the uncorrected range; all you have to do is to "targ" the set-forward point and bring up the gun arm as usual, then slip the whole corrector device bodily along the gun arm until the stop butts against the targ,—and there you are! Look at the range indicated by the pointer; it is the corrected range which goes straight to the guns without further ado.

The mission of this device is easily stated and no less easily understood. Its main object is to cut down the time occupied in predicting or, more precisely, the time occupied in applying corrections. I won't say how many seconds it will save in *your* plotting room; I'm not attempting to gild refined gold or speed up the lightning; just talking about the *average* plotting room, y'understand. But in the halcyon days when I had a plotting room of my own I judged that it saved from three to five seconds on an average prediction. And with a hard boiled range setter, prone to inquire searchingly of the plotter (after drill) why the "blanked" ranges were so slow in coming out—under such circumstances the saving of a few seconds looms large in the eyes of the range section.

The working of this device depends upon the proposition that the Range Board Operator can predict his corrections. That is, he can tell, after a few predictions, just what the amount of the range correction is going to be for the next prediction. This is because, under ordinary circumstances, the correction will change but slowly and

more or less uniformly. Instead of using the regular range scales on the correction board it is found to be better to make a paper scale and index and place it on the right end of the usual scales; it can be read much more easily and quickly. This new scale may be graduated in any convenient manner so long as it corresponds to the scale on the body of the "corrector". In other words, a movement on the range correction board scale which represents a certain number of yards must correspond to a movement on the range correction scale of the corrector of exactly the same number of yards. Both scales, for convenience, should be graduated alike, but the graduations may represent reference numbers, hundreds of yards or even rubles and kopecks, so long as the scales correspond.

So far, so good; now let us assume that the Range Board Operator has ascertained what the range correction is going to be. He then goes to the gun arm of the plotting board and moves the index slide of the corrector (carrying with it the pointer slide) until the index is opposite the proper graduation on the range correction slide. He must be careful not to disturb the setting of the pointer slide with respect to the double index. He then returns to his range correction board and works it as usual, not bothering the corrector until the value of the range correction changes. As soon as this happens, he sets the new value on the range correction scale of the corrector.

The plotter predicts as usual and then reads off the CORRECTED RANGE to the set forward point as described above, and sends it direct to the guns. So we save all of the time which was formerly used up by the range board operator and, in some cases, we also eliminate a little of the talking which must otherwise occur during plotting.

The "arbitrary correction scale" is for the purpose of applying such arbitrary corrections as may be ordered by the battery commander. Each BC has his own pet ways of ordering and keeping track of his arbitrary corrections and therefore the numbering of this scale in hundreds of yards, as shown in Fig. 1, might not suit his system. That is a minor point, however, involving nothing more serious than the re-numbering of the scale to suit his particular methods. The main idea is that when the plotter predicts, all of the range corrections have already been applied to the corrector and he simply reads off the corrected range instead of the actual range.

The half-tone published herewith gives a better idea than Fig. 1 of the appearance of this corrector and has the incidental advantage of convincing the doubting Thomases that this device is not a figment of the imagination but has actually been made and, presumably, used. This one, shown in the picture was made by an expert Ordnance machinist and is now in use "somewhere in Panama". The instrument could probably be made in wood, with paper scales, though the making might be a troublesome task. But anyway, it "works"! To be sure, it might

be better to apply the principle of this device to the gun arm itself, that is, have the butt of the gun arm incased in a sleeve and movable therein, actuated by two independent rack-and-pinion movements, one for the arbitrary corrections and the other for the range corrections. This would have the advantage of relieving the plotter of even that small job of bringing the corrector down to the targ; the gun arm would have been run in or out by the proper amount, instead. The task of making

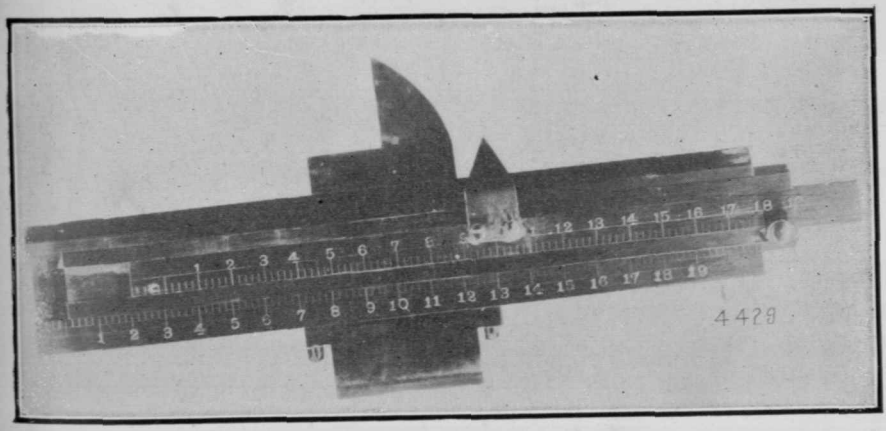


FIG. 2

this alteration to the board was a bit beyond our capabilities at the time the corrector was made, though it would probably present a better solution. In either case, this "corrector" is not expected to revolutionize our range finding methods; it is submitted merely as a proposition which might aid those battery commanders who are trying to speed up their range sections, and to exemplify a principle which can and should be much more widely applied.

EDITORIAL

Colonel James M. Williams

In June, 1921, the JOURNAL announced the death of Brigadier General John W. Ruckman, the first Editor of the JOURNAL, and the first to go among the former editors of this publication. Now the Grim Reaper has gathered a second of our standard bearers—Colonel James M. Williams, United States Army, Retired, who as Major, Coast Artillery Corps, served as Editor of the JOURNAL from July, 1912, to September, 1915.

From press announcements it was learned that Colonel Williams, his wife, and sister, were struck and instantly killed by a railroad train at Durham, N. C. while motoring from Montgomery, Ala. to Fort Totten, N. Y. Colonel and Mrs. Williams are survived by a daughter, Miss Elanor Williams, who shares the sympathy of all in the Coast Artillery service in her shocking bereavement.

Colonel Williams was born at Montgomery, Alabama, April 12, 1873, entered the Military Academy June 17, 1890, from which he graduated as a Second Lieutenant of the 1st Artillery, June 12, 1894. Subsequently he served as an instructor at the Military Academy, and during the World War held the command of Corregidor, the greatest single stronghold of the United States or of the world. He was retired at his own request for over thirty years' service on June 30, 1920.

The photograph of Colonel Williams reproduced in this issue was taken in the period when Colonel Williams was Editor of the JOURNAL.

Colonel James M. Williams

United We Stand—

During the late summer of 1918, a certain Coast Artillery officer had occasion to visit numerous Coast Artillery battalions of heavy artillery then at the front and attached to two French Armies as well as the American First Army. Among these organizations visited were two which displayed such marked differences in a certain particular, that a comparison between the two was inevitable. The officer referred to, after having reported to the headquarters of one of these battalions, visited the battery positions and spent some time with the officers of each battery, with some of whom he was well acquainted. It was easily noticeable that there were rather distinct differences in many of the details of interior administration and organization of positions as between the two batteries, and what was unfortunate, a noticeable attitude of jealousy and suspicion on the part of the personnel of each battery for the members and methods of the other. After concluding his inspection of the battery positions and materiel, the visiting officer returned to battalion headquarters, and was accompanied through the woods by two of the officers of one of the batteries. When the three had approached within about 200 yards of the Battalion P. C. the two battery officers held out their hands and said they would say goodbye. Upon being questioned as to why they did not go all the way to battalion headquarters, they replied in effect that battery officers were not welcomed around battalion headquarters, and that they never put in an appearance there unless absolutely required to. Later on, casual conversation with the battalion commander and the other personnel at headquarters indicated that there existed an equal lack of cordiality in the feeling of the headquarters personnel for the battery personnel of the battalion.

After this experience it was only natural that the visiting officer should have been keenly impressed with the contrast in the relations between all the officers in the next battalion which he visited. In this second case the battalion commander had arranged so that his P. C. was not far from the gun positions, and that all the personnel, both commissioned and enlisted of both batteries and of headquarters, were encamped together in a near-by wood, while all the officers of the battalion except those of the rear echelon maintained a common mess. The mission of the battalion called for almost daily firings, which were divided between the two batteries, and the results of which were the occasion for good natured discussion at the battalion mess. The respect and cordial good will entertained for the battalion commander by all the officers of each grade, were plainly apparent, while the results of the constant association and genuine comradeship within the battalion were evidenced in innumerable ways. While each of the two

battery commanders had his own pet schemes for the rapid preparation and transfer of fire, yet the methods of fire and the manner of organizing the positions were strikingly uniform for both batteries. When a random German shell wrecked the kitchen of one battery and wounded a cook, the kitchen of the other battery fed the whole battalion until the devastated kitchen could be rehabilitated. The rear echelon of the battalion, in a little town several kilometers to the rear, was organized as a single unit for administration and messing, including all the personnel of both batteries and battalion headquarters on duty there.

Harking back to this remarkable contrast after the lapse of four years, it is believed that many Coast Artillery officers will be able to find somewhat similar, if not such pronounced parallels, in the handling of other Coast Artillery units, fixed defense fire commands as well as mobile battalions. If it is unpleasant to tear aside the curtain of the years from the unhappy condition which prevailed in the Coast Artillery organization first mentioned, it is no less a pleasure to remember and record the splendid *esprit* in the other battalion which have here been sketched. The justification for the presentation of this comparison here and now arises from the fact that in the unhappy battalion the standard of efficiency in every detail of its work was noticably below the standard in corresponding details which was maintained in the happy battalion. Where there are constant association and intimacy of acquaintance and discussion, there is less opportunity for real misunderstanding and friction. Competition is one thing while jealousy is another. Active minds will naturally diverge one from another, but if divergence of opinion is not accompanied by lack of acquaintance, it will be marked by sympathetic understanding rather than by contempt and recrimination. It is hard to be hostile to a man you really understand.

The Coast Artillery stands today on the threshold of great progress. This progress will most rapidly be attained by the untrammeled exercise of individual initiative. That initiative will not less effectively produce results if each officer and man is in constant touch with the thought and efforts of his associates, for the Coast Artillery technique eventually to be crystallized will be the product not of any one or few, but of the respectful collaboration of kindred spirits.

Major Hazeltine on Analysis

The following letter received by the Chief of Coast Artillery from Major R. H. Hazeltine, C. A. R. C., so impressed General Coe as to the possible importance of some of its suggestions, that it was transmitted to the Editor of the JOURNAL, with authority for its publication:

49 West 44th St., New York City, N. Y.
August 18, 1922.

My dear General Coe:

This letter is in response to your invitation given to Coast Artillery Reserve Officers at the dinner of their Association in New York in November 1921.

Recently I have acquired some experience along the line of training Coast Artillery Reserve Officers.

This experience has developed a question which is believed to be an important one in the development of Reserve Officers of our branch.

In the service of every officer in Coast Artillery, there comes a time when he is called upon to fire a battery of either the minor or major calibre, in practice or perhaps in action.

Under present regulations it is mandatory to analyze every shot so fired, to hold a Fire Commander's Critique, the Fire Commander must verify the analysis, and write certain reports. In the following suggestions there is no attempt to minimize the recognized value of a careful analysis of drill or of Target Practice, but they are made simply in order to make it possible for the Reserve Officers to really get more out of the brief training period.

Training Regulations 10-5 give us a perfectly definite and a properly exacting mission, to wit:

"This Branch will be trained in; (1) Opening effective fire in the minimum time with the gun to which assigned against any target within its range, and sustaining such fire at a maximum rate."

From the standpoint of the Reserve Officer the firing of a string of shots from even a 3" R. F. Battery every few years or even every year is an event, similar to an atheletic test between rival teams who have trained intensively for a considerable period, the contest itself being over in a few minutes.

It is an event which distracts his attention from the main element of the problem, namely that of opening effective fire in a minumum of time, until he is so experienced in firing that:

The mechanics of firing a battery is automatic with him, that the exercise of command over his battery is second nature, requiring no effort or special thought, in order that;

He may devote his entire thought to a rapid adjustment, and solution of the problem in hand.

It is believed that this state of experience can only be attained by numerous firings, much more in fact than is possible to have under present conditions.

In the training period just concluded the 14 officers were divided into groups and it was possible for 9 of the 14 to fire an adjustment problem from the 3" R. F. Battery, a result which is believed to be remarkable, in view of the short time available, and the delays incident to the safety of the field of fire; fortunately fog did not delay at all.

Based on my experience as Fire Commander in these instruction firings as well as in the case of three earlier ones, it is my opinion that the group idea is an excellent one, and in fact the only practical method of handling the situation efficiently.

For the purpose of gaining time in order to be able to finish all the analyses, the firings in each group were included in one report, the reports of the 3 groups firing were handled as one analysis for the Fire Commander's Critique. It would have been physically impossible to have completed the work otherwise, and even

then this was only made possible by verifying the nine analyses as fast as the computations were complete, but it was not possible to verify each figure in all four copies required, nor was it possible to read, digest, and comment on the reports and discussions contained in the nine reports.

It will be realized there were only a few officers in training this summer, but a mere handful of those who should be given this training, but it is realized that it was on account of the action of Congress in cutting down the appropriation to such a small figure, that this was made necessary; it is, however, not difficult to see the difficulties that would have been encountered, if, for instance, a larger quota had been possible, to complete the analyses.

It is believed that if the officers are divided into groups and then each officer of each group fire a problem, having the group make a thorough analysis of one selected problem, making only an informal analysis of the remainder, but submitting the necessary reports for the Ordnance, that there would be sufficient time not only to complete the analyses properly, but to permit those most in need of experience in firing to fire additional problems.

It is believed that as an officer becomes experienced in conduct of fire, that more time would be devoted by him to analysis, without it becoming irksome. He is at least in a better position to make the proper deductions from his analysis and to make use of it.

In other words his training should be progressive:

1st To learn how to fire a battery, confidently.
2nd To learn how to direct its fire so as to reach an adjustment in a minimum time.
3rd To learn how to make a thorough analysis, to make correct deductions therefrom, and to make use of the information so obtained, to increase the effectiveness of his battery at future practice or in action.

He would, as a matter of fact, gain a certain amount of training in all three phases from the start, but, in the first phase, the ability to handle the battery during firing without confusion would be emphasized. In the second phase, Fire direction and Adjustment would be stressed, while in the third phase he would be rounded out into an efficient Battery Commander in practice or in action, and, if promoted to field grade, he would be better able to train his command, intelligently, confidently, and effectively.

I have attempted to give you in this somewhat lengthy letter what seems to be the trend of thought among Reserve Officers with whom I have come in contact this summer, and submit it for what it may be worth to you in future training plans.

Very sincerely yours,
(Sgd) R. H. Hazeltine,
Major, CA-ORC

✣ ✣ ✣

55th Artillery, C. A. C., Develops G. P. F. as Seacoast Weapon

In view of the announced policy of utilizing extensively the G. P. F. to supplement the 6-inch Seacoast Gun, the following account of the work already done, by the 55th Artillery, C. A. C., in adapting the G. P. F. to its new Coast Artillery mission will be of general interest.

HEADQUARTERS
HAWAIIAN COAST ARTILLERY DISTRICT
HONOLULU H. T.

September 6, 1922.

Editor, Coast Artillery Journal,
Fort Monroe, Virginia.

Dear Sir:

It is believed that the rest of the Corps will be interested in the development work now being carried on in this District by the 55th Artillery, C. A. C., commanded by Lieut. Colonel Frank B. Edwards, C. A. C., in connection with the use of 155 m/m G. P. F. guns on moving water targets, in both day and night target practices.

The following practices have been completed to date:

FIRST PRACTICE, November 1921:

Provisional Battalion, 155 m/m guns (4th and 7th Companies Honolulu), Major C. A. French, C. A. C., commanding, (These companies later became Batteries G and H, 55th Artillery).

Position: Fort Ruger. Indirect fire.
Fire control equipment: Improvised plotting board and accessory equipment.
Observation: Bi-lateral terrestrial.
Target: Pyramidal with sail.
Maximum range: 18,300 yards.

SECOND PRACTICE, May 1922:

1st Battalion, 55th Artillery, Major C. U. Edwards, C. A. C., commanding.
2nd Battalion, 55th Artillery, Major G. D. Holland, C. A. C., commanding.
Position: Fort Kamehameha.
Fire control equipment: Barr and Stroud 108" base coincident range finder; Cole spotting board, field T-I apparatus, etc. Case III.
Observation: Terrestrial, balloon and airplane.
Target: Drifting pyramidal.
Maximum range: 7600 yards (approx).
Method of fire: Battery and group volleys.

THIRD PRACTICE, June 1922.

3rd Battalion, 55th Artillery, Major G. D. Holland, C. A. C., commanding.
Positions: Puena Point (North Shore Oahu).
Fire control equipment: Barr and Stroud 108" base range finder; Cole spotting board, improvised plotting board, field T-I apparatus, difference charts, etc. Case III.
Observation: Terrestrial and airplane.
Target: Drifting pyramidal.
Maximum range: 7700 yards.
Method of fire: Battery and group salvos and volleys. Both day and night firing. Searchlights from Battery A 64th Arty. C. A. C.

FOURTH PRACTICE, July 1922.

2nd Battalion, 55th Artillery, Major F. A. Mountford, C. A. C., commanding.
Positions: Near Koko Head.
Fire control equipment: Modified Whistler-Hearn plotting board; Cole spotting board, various improvised conversion rules, field T-I apparatus, etc. Case III.
Observation: Bi-lateral Terrestrial, and Aeroplane.
Target: Drifting pyramidal.
Maximum range: 12,000 yards (approx).
Method of fire: Battery volleys.

Each practice has included several adjustment problems and very satisfactory results have been obtained. In each case these practices have been preceded by a night march into position. In the case of the firing at Puena Point, the 3rd Battalion made a night march across the entire Island (from the South to the North shore).

These practices have proved very conclusively the value of the G. P. F. gun as a weapon against moving water targets. The guns have not only proven themselves suitable as replacements for the fixed Coast Artillery, intermediate armament, but their mobility makes them available for employment against enemy vessels in landing operations on otherwise unfortified beaches.

The battalion commanders have been requested to prepare papers for publication in the Journal, on the progress that has been made in this work.

(Sgd) MEADE WILDRICK,
Major, C. A. C.,
Adjutant.

GIVE RESPONSIBILITY TO A RADICAL AND HE GENERALLY BECOMES A CONSERVATIVE. THINK OF THIS WHEN YOU CHAFE AT PAPERWORK AND REGULATIONS.

COAST ARTILLERY BOARD NOTES

Work of Board for Month of August, 1922

MEMBERS of the C. A. Board on September 1, 1922:
Colonel H. J. Hatch, C. A. C., President.
Major W. B. Hardigg, Ord. Dept.
Captain J. F. Stiley, C. A. C.
Captain G. W. Morris, Signal Corps.
Captain L. W. Jefferson, Jr., C. A. C., Secretary.
1st Lieutenant J. J. Johnson, C. A. C.
The following officers were attached to the Board on Sept. 1, 1922:
Major J. S. Pratt, C. A. C.
Major H. F. Spurgin, C. A. C.
Major R. B. Colton, C. A. C.
Captain A. Bradshaw, Jr., C. A. C.

1. The preparation of Training Regulations continued to be the principal work of the Board during August and September. In addition to the pamphlets noted in the September JOURNAL as completed and nearing completion, the following is nearly completed:

Service of the Piece for 12-inch Mortars.

2. The following training regulations initiated by other Branches of the service were received, reviewed and commented on by the Board:

Machine Gun—Indirect Fire.
Automatic Rifle Marksmanship.
Occupational Index and Minimum Specifications.
Field Service Regulations.
Definitions, Ordnance and Field Artillery.
Use of maps in firing.
Intelligence Service.

3. Part V of Heavy Artillery Matériel, Coast Artillery Corps, prepared under the supervision of the Board has just been printed. This completes the series on Matériel, Parts I, II, III, IV and VI having already been printed.

4. The usual amount of work has been accomplished on preparation of Range and Elevation tables, this branch of the Board's activities being continuous from month to month.

5. New projects received by the Board during the month of August:
   a. Training Regulations on Automatic Rifle Marksmanship and Indirect Fire for Machine Guns were reviewed and returned.

b. The Wells Spotting Chart, which will be considered with devices of a similar nature.

c. A report on further development of a Radio Direction Finder for the Coast Artillery has been received from the Signal Corps and will be considered by the Board.

6. Projects completed during the month of August.

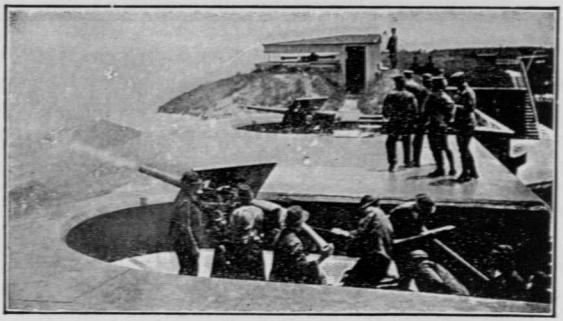
a. Make-UR-Own Dry Batteries.

(1) As stated in these columns in a previous issue this type of dry battery is being given a series of tests with the object of determining its value for service use. The main feature that commends consideration of this dry battery is the fact that the ingredient parts are carried separately until such time as it is desired to place battery in service with a result that the loss experienced in the ordinary type of flashlight battery due to deterioration is very largely prevented.

7. Considerable time was devoted by several members of the Board to the test of self contained Range Finders. There are on hand for test several types of range finders, based on both the coincidence and stereoscopic principles. These have received a preliminary try-out and have been put in shape for use. Plans have been drawn for a comprehensive simultaneous test of these instruments by both officers and enlisted observers with a view to determining which best meets the needs of the Service. In this connection, tests will be run to select the best light ray filters designed to diminish the effects of haze and glare.

8. There are on hand several spotting boards, deflection computers and range correction devices. Plans are being made whereby a test can be run so that these devices may be compared with each other and with devices already in use in the Coast Artillery with a view to determining their relative merits. It is planned to conduct the test in conjunction with the joint Coast Artillery and Air Service training maneuvers to be held at Fort Monroe sometime this fall.

9. A new model time-interval apparatus for mobile artillery units has received a preliminary test during which very satisfactory results were obtained. The apparatus has been turned over to the Mobile Artillery units at Camp Eustis for further practical test.



Employment of Heavy Artillery—Problem No. 3—A Solution

1st Requirement:

Maj A divides his personnel into 3 parties for reconnaissance as follows:

1st Party Bn Comdr. Camouflage Officer, Orientation Officer, Signal Officer, Scouts and Battery Agents, Instrument NCO.

2nd Party Battery Comdrs and Battery Details which consist of a Lieut. Orienteur, the orienteur and observation details and a communication Sgt.

3rd Party Radio Officer, Bn Surgeon, Bn and Battery telephone details and materiel.

After leaving instructions for his 2nd and 3d parties to join him at CR 621 (359.5-744.8) at 12:00 Noon he proceeds with his 1st party via WHITEHALL SH—CR 595—RJ 587W—to CR 621, arriving at 9:30 AM where he leaves his transportation in the shelter of trees near the road and accompanied by the Camouflage Officer, Orentation Officer and Battery Agents he proceeds on foot along road 621—610—592 looking for possible battery positions. Upon arriving at the turn in the road at 592 Maj A has decided that he will put Btry A in position on road just south of 610 and behind the small orchard at that point and Btry B on the same road just south of MEYER road junction where road passes through woods. As soon as he has selected the position of the base pieces he has the Orientation Officer get ready to tie these in. The Camouflage Officer gives him an estimate as to the amount of camouflage material necessary and an order for same on the nearest Engineer dump. This having been done they return to CR 621 where Maj A sends the Camouflage Officer back to Brig Hq by motorcycle, giving the driver the order for the camouflage with instructions to deliver it to the Supply Officer at SCHILD FARM. The driver also carries a message from the Orientation Officer for his detail to proceed immediately to CR 621 with their equipment.

It is now 10:30 AM and Maj A's next move is to pick out his Bn OP. He goes by motorcycle accompanied by two scout corporals to the house at 357-747 where he has previously decided from looking at the map that he might place his OP. Upon reaching this place he sees that he has a good field of view from the roof and decides to make it his Bn OP; he leaves a Scout Corporal to make a duplicate panoramic sketch of the field of view and sends the other corporal to HILL

571 (356.9-748.9) to make a similar sketch for a possible Btry OP. Maj A now returns to CR 621 and picks out his Bn CP at house near unimproved road at 360-744. The second and third parties have now arrived and the Btry Comdrs after consultation with Maj A, who acquaints them with the results of his own reconnaissance, proceed to make their reconnaissances, being shown to the positions by the Btry Agents.

Maj A now directs the Signal Officer to make a sketch of his proposed communications while he, accompanied by the Bn Surgeon, picks out the position for the aid station. They decide to locate this station in house near PLUM CREEK at 359.2-743. Upon his return to CR 621 Maj A approves the plan of the Signal Officer and directs him to start his work as soon as possible. He now returns to his Bn at SCHILD FARM and on his way determines to put his rear echelon in woods just south of CR 595 at 361.1-744.0

Upon arriving at SCHILD FARM Maj A makes a sketch of the positions selected, his CP and OP and sends it together with a panoramic sketch of the field of view from the OP to the CG 301st FA Brig. He then at 2:30 PM assembles his officers and acquaints them with the results of his reconnaissance.

2nd Requirement:

See tracing on transparent insert herewith. To be placed over Bonneauville Sheet of Gettysburg 3-inch map.

3d Requirement:

Owing to the fact that it is impracticable for the men to be subsisted from the rear echelon due to its distance to the rear, the forward echelon should have 1 kitchen trailer, 1 water trailer, and two tractors per battery, 1-5 passenger motor car, 4 motorcycles, and 1 ambulance.

4th Requirement:

See sketch on Page 354.

Employment of Heavy Artillery—Problem No. 4

References:

Maps: Gettysburg 3-inch, New Oxford, Bonneauville, Gettysburg and Hunterstown Sheets, and 1-inch reduced from 12-inch War Game Map.

Plate: Conventional Signs, Artillery Units, printed on Page 271, September JOURNAL.

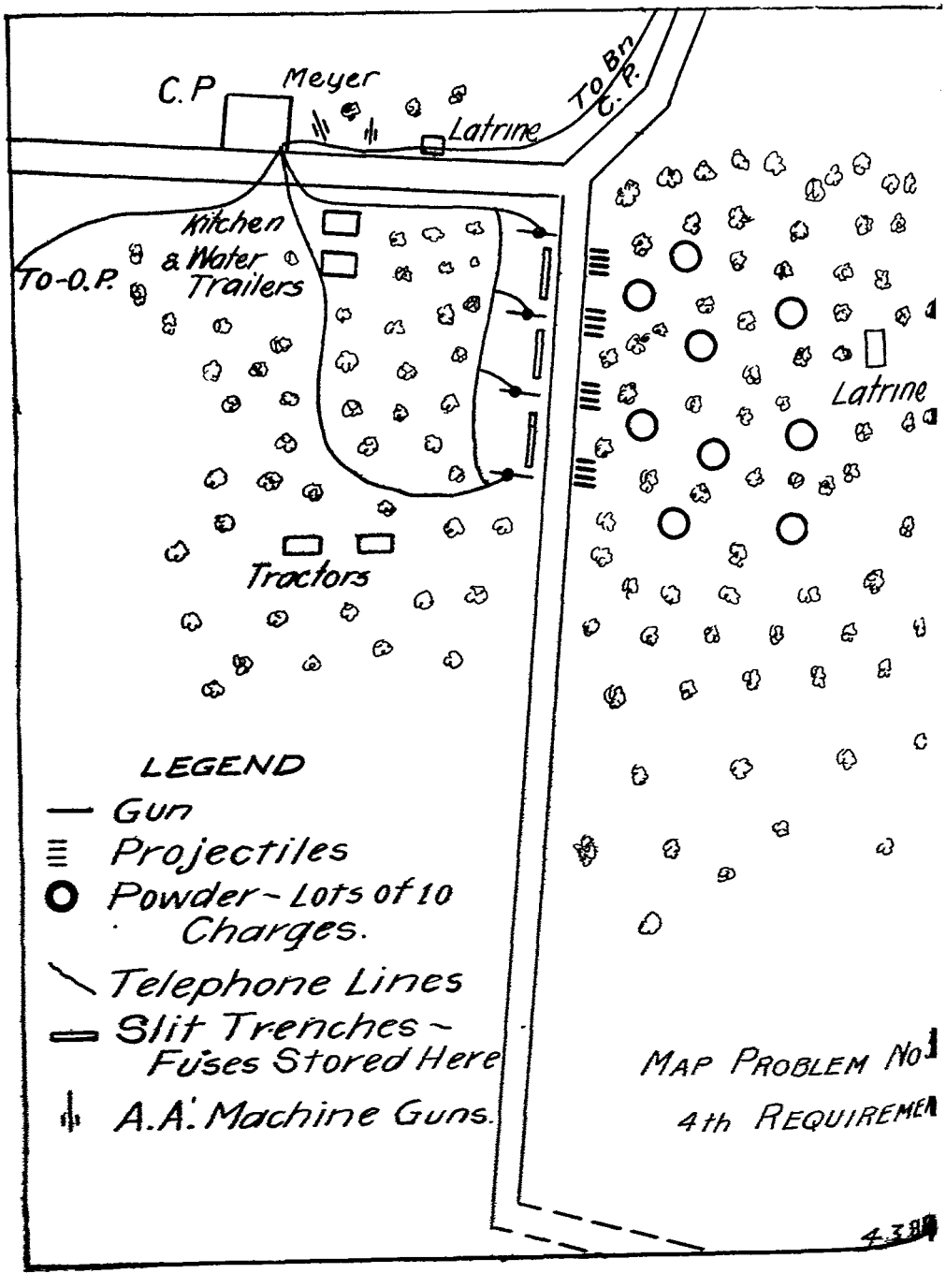
Extracts from C. A. S. Mimeograph covering Reconnaissance, Selection and Occupation of Positions, printed on Pages 272-278, September JOURNAL

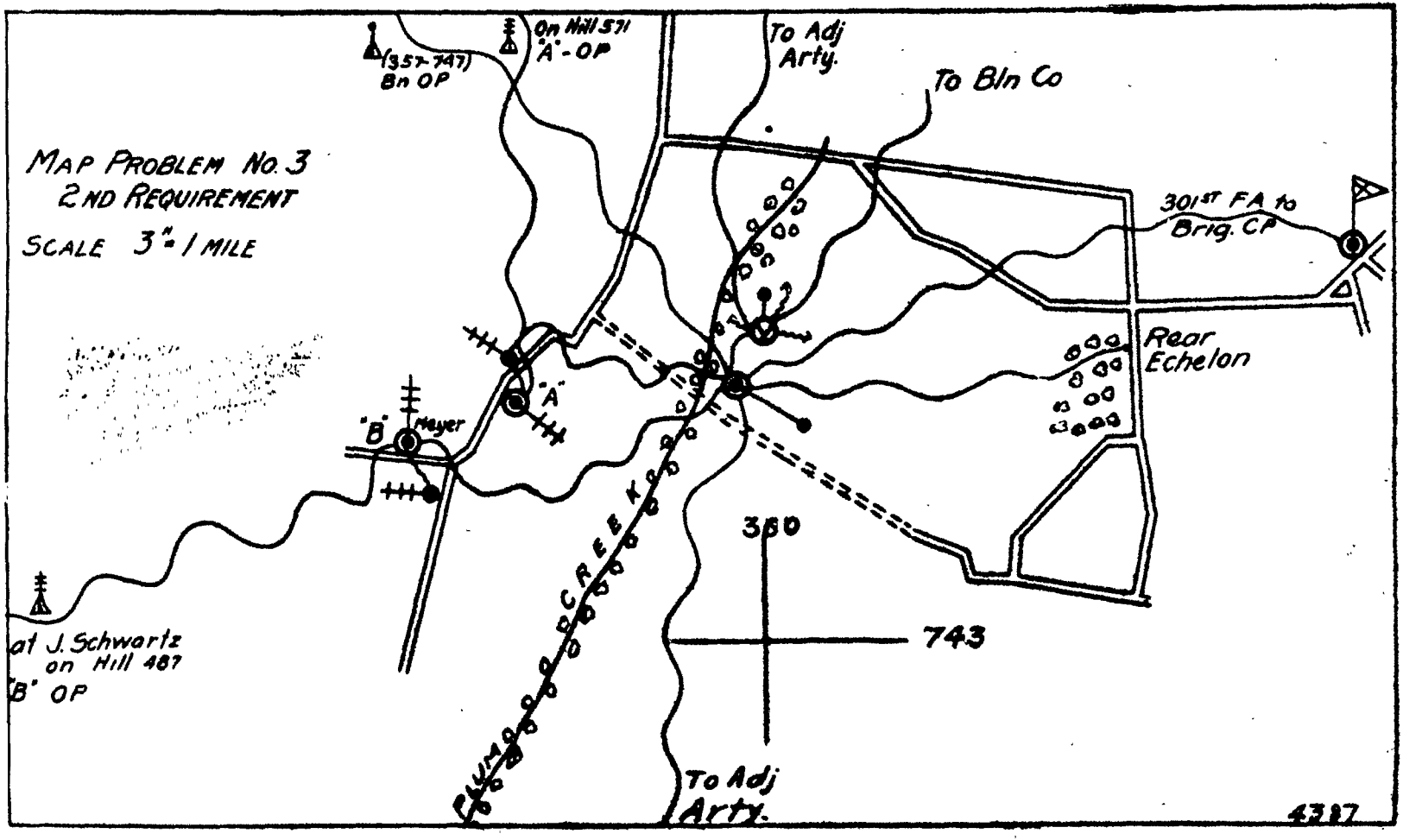
General Situation:

The Blue Ridge Mountains and the Maryland-Pennsylvania line eastward form the boundary line between two hostile states; Reds to the west and north Blues to the east and south.

War was declared 15 February 1922. Since 15 March 1922 the 1st and 2nd Blue Armies have been in contact with the enemy along the general line (338-738) —FAIRPLAY—WILLOW GROVE SH—WHITE RUN—GRANITE HILL—HUNTERSTOWN—NEWCHESTER—(364-765). Both sides have been improving their lines.

The Boundary between the Blue 4th Corps on the right and 3d Corps on the left is the line GRANITE HILL—CENTENNIAL.


C.P
Meyer
Latrine
To Bn C.P.
Kitchen & Water Trailers
To O.P.
Latrine
Tractors
LEGEND
Gun
Projectiles
Powder - Lots of 10 Charges.
Telephone Lines
Slit Trenches - Fuses Stored Here
A.A. Machine Guns.
MAP PROBLEM NO
4th REQUIREME
4 3



Reference for Employment of Heavy Artillery—Problem No. 3—Solution.

Special Situation: (Blue)

The 1st Bn 901st Artillery (12-in. mortars Ry CAC troops) with its section of Service Battery and Attached Ordnance and Medical troops, sent from CAMP EUSTIS, VA. in two sections, arrived at NEW OXFORD, PA. at 9:00 PM and 10:00 PM 26 March respectively. The battalion commander was met by a motorcycle messenger with a written message from Hq 1st Army Artillery directing that he detrain immediately on arrival and release all railway cars except those authorized by the Tables of Organization. Major A is further directed to report at Hq Army Artillery at UNION MILLS (8 miles East of TANEYTOWN) the following morning at 9:00 o'clock. Major A reports at 9:00 AM 27 March as above directed and is there given the following order:

ARMY ART 1ST ARMY
UNION MILLS, PA.
27 MARCH 22 9:00 AM

Memorandum:

1. The 1st Bn 901st Artillery (12-in. mortars Ry CAC troops) having reported in the Army Area will take up positions on the Western Maryland R. R. between co-ordinates of 360 and 363 (in 4th Corps Sector) during the night of 27-28 March. It is attached to the 3d Corps for tactical control.
2. Free use may be made of all railroad tracks, including sidings west of co-ordinate line 366.5 1st Army controls same eastward. No loaded ammunition cars will be stored in NEW OXFORD.
3. All details of administration and supply, including supply of ammunition, will be handled by these headquarters.

By command of Maj Gen. B:

X
Col. G. S.
Plans and Training Officer

Copies To:
1st Army (2)
C O 1st Bn 901st Art.
Staff Army Artillery
3d Corps
4th Corps
War Diary
Files.

In addition he is directed to connect his battalion to nearest forward communication center of the Army Telephone Net, at NEW OXFORD Square.

Colonel X communicates by telephone with the 3d Corps and informs it as to the arrival of Major A with his battalion. The 3d Corps then directs that this battalion be placed under the tactical control of the 301st FA Brigade (CP WHITEHALL SH 362.2-744.4) and that Major A report to the commander of that Brigade without delay.

Major A then proceeds with his staff and reports to the CG 301st FA Brig as above directed at 10:00 AM. He is there shown the enemy situation, also the Army and Corps boundaries and the normal and eventual zones of action of army, corps, and divisional artillery. He is informed that his probable targets will be the wooded hills to south and east of Gettysburg; that for observation he can partially depend on the balloon at E. ECKER (362.8-746.0) which can be reached through switchboard at CP 301st FA Brig and the Central at NEW OXFORD. He is instructed to establish his own OP's so as to obtain bilateral observation over a maximum area within the limiting range of his Mortars. He is furnished with plan of Signal Communication.

He secures the following documents and information:

5 copies map 1/20,000 or 3-inch of the areas which will be covered by the fire of his battalion. (These maps also show artillery objectives and enemy organizations.

3 copies of map 1/62,500 showing scheme of road circulation.

3 copies of such AIS bulletins, previously published, as contain information of interest.to this battalion.

1 copy of orientation data (in the form of a railway alignment map).

3 copies of suuh field and general orders, issued by the Chief of Artillery 1st Army as may be of interest to this battalion.

3 copies of 1/62,500 maps showing areas visible from hostile OP's and of observation battalions established on fronts of 3d and 4th Corps.

Location of Railheads for rations—NEW OXFORD.

Location of Railheads for clothing and Q. M. supplies BERLIN JUNCTION.

Location of points where gasoline may be drawn—RED HILL S. H.

Location of camouflage officers and dump. Camouflage officer, III Corps, MT. PLEASANT S. H.; DUMP. SELLS STATION.

Location of Engineer Dumps—LEFEVRE

Location and name of railway officers controlling movements, supply of coal and water—NEW OXFORD. Col G, C. E.

Location of Hq. III Corps—MT. PLEASANT S. H.

Ammunition will be obtained from the dump at BILLINGERS. (about 2500 SE of BERLIN JUNCTION)

Location of meteorological stations and hours at which they send out data by radio.—ASH GROVE S. H.; 1 PM, 5 PM, 9 PM, 1 AM, 5 AM.

1st Requirement:

As Major A give a description of your movements after 10:00 AM and use made of your Bn Hqrs personnel in connection with your reconnaissance and occupation of the position. This includes your instructions for sending up guns to firing position, communications to be established, your arrangements for service of ammunition, your disposition of railway cars not required at the battery, location of your Aid Station and rear echelon, and arrangements for camouflage. (Capacity of ammunition cars is 48 rounds each). Give reasons for your selection of gun positions and stations.

2d Requirement:

Tracing (3-in. equals 1 mile) showing location of each mortar, all OP's and CP's, Aid Station, and all telephone lines within the battalion.

3d Requirement:

As C O Btry A what protection would you provide for your personnel at the battery position? Give a brief description of method of occupation of position including use made of battery personnel.

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THE BULLETIN BOARD

The Citizens Military Training Camp at Fort Monroe

In these days of hard times when money, officers, and men are scarce, too much cannot be said of the officers at Fort Monroe who have overcome difficulties and rebuffs and put across a course of training which can well serve as a model for the other coast defenses where similar courses have to be conducted.

From the viewpoint of the old timer, the impossible has been accomplished before our very eyes; that is, green, raw recruits have been skillfully molded into artillerymen who have manned every detail in the battery and actually fired major-caliber guns.

It was only a few years ago that the mysteries of gunnery and target practice were known to a select few and no others. The average soldier had the feeling that all of this was "heavy tech" and way beyond his powers of comprehension. Such was the attitude of the authorities, and even an officer had to have years of experience before he could be trusted or even expected successfully to fire a battery. Month after month was devoted to training a particular soldier for a particular job before he was considered fit to take his part, no matter how small, in firing a battery. And today, note the contrast, it is taken as a matter of course that a commanding officer through his subordinates, can, in a few short weeks accomplish what previously took months and years.

The method of classification or segregation of the C. M. T. C. students is outlined in S. R. 44-b, but it does not and cannot solve the various and sundry problems which present themselves to the commanding officer. It is a simple matter to sit down at a desk and get out an order to the effect that a certain number of civilians will be given a certain amount of training betweeen certain prescribed dates, but it is still another matter to take these selfsame civilians and make them into soldiers over night, so to speak. Picture to yourself an assembly of several hundred men and boys (sixteen is the minimum age limit) all dressed to suit their individual taste or lack of taste, each with an entirely different personality, little or no knowledge of military life, and all of them with a complete disregard for discipline or deference which is a characteristic of young America. This was the snarl which had to be untangled at the offset.

Officers from the Coast Defenses and the Training Center were assigned to the camp to do their share in the classifying, organizing, and instructing of these men. The Camp Commander Colonel J. B. Mitchell with his adjutant and senior instructor handled the executive, business and the academic side of the camp. All of the students (members of the camp) were classified into three different groups according to their individual qualifications. All of the men who had no military training of any kind were placed in the *red* group; men who had attended the red course previously were placed in the *white* group, and the remaining men, regardless

of whether they were civilians, warrant officers, or non-commissioned officers in the Regular Army, National Guard, or Reserve Corps, provided they had sufficient education technical or general to make them eligible for appointment in the Officers Reserve Corps, were placed in the *blue* group. Each group was then divided into three parts, and three companies organized, each consisting of red, white, and blue men. This method made it possible to utilize such knowledge as the white and blue men had on the red.

Two companies were commanded by regular army captains and the third by a Reserve Captain. Each company ran its own mess, using two cooks each from the regular companies, a "regular" mess sergeant and a student mess sergeant. Each student was given practical problems in mess management and figuring ration values so that every man had a clear and concise understanding of just what it means to feed one hundred men and make the food allowance cover the ration period.

The education of these men ranged between such extreme limits that the problem of striking a happy medium was difficult. What was very hard to grasp for one man would be A, B, C, for another. One might man be a whiz scholastically and be totally ignorant of the military work and vice-versa, and so it went with the result that everbody had to turn to and help each other.

The day in camp began at 5:30 in the morning, and a very strenuous day followed which was concluded with taps at 11:00 o'clock. The training schedule was the year's training schedule of regular troops boiled down to six weeks. The day was begun with infantry drill in which all groups participated. This work includes the many phases of close order, ceremonies, guard mounting, tent pitching, and military courtesy. Artillery instruction followed on major and minor caliber guns, and mortars. Each man had his chance to discharge the duties of the different men in the gun and range detachments. The study of the nomenclature of powder, fuzes, primers, projectiles and cordage kept the artillery period full. The elements of map making and elementary sketching were tackled with a zeal which precludes any possibility of the subjects being too advanced. Their only pause was when mess call sounded.

Athletics were strongly featured. Each company had its own ball team and an inter-company league made competition for supremacy very keen. The "Buddy" system has removed all risk from the pleasure and benefits of swimming. Each man has a "buddy" who he watches in the water with the result that every man has someone looking out for him all of the time and no one can be lost without its immediate discovery.

The re-creation of these men is phenomenal. Their transformation is complete. They came as recruits and leave as soldiers, and proud that they are all the name soldier implies. Our hat goes off to them for having won the victory, and our congratulations go to the officers who have wrought the change.

The following syllabus containing the principal features in a camp of this kind may serve as a guide in conducting future training camps.

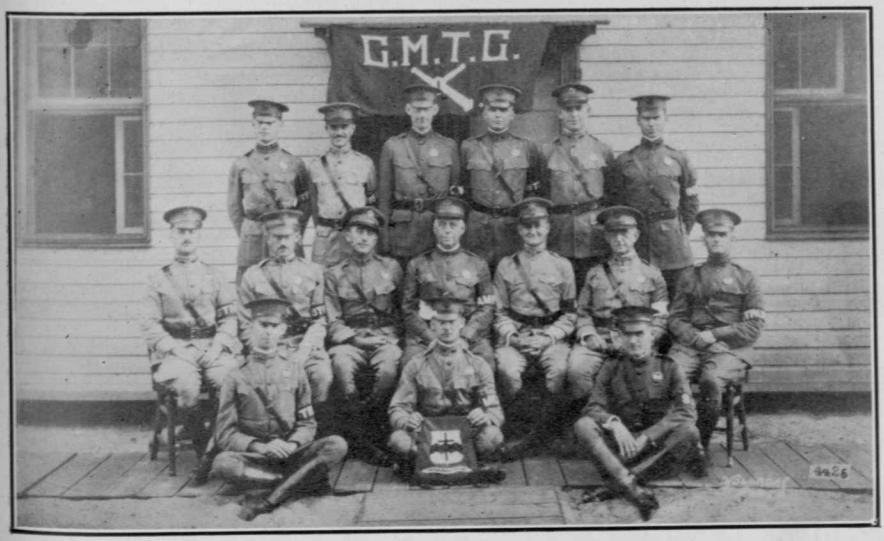
ORGANIZATION OF CAMP

Camp Commander:	Colonel J. B. Mitchell, C. A. C.
Executive Officer:	Major E. Montgomery, C. A. C.
Senior Instructor:	Captain Dale D. Hinman, C. A. C.
Camp Adjutant:	Captain Aaron Bradshaw, Jr. C. A. C.
Surgeon:	Captain J. G. Newgord, M. C.
Publicity Officer:	Lieutenant H. O. Bixby, C. A. C.
Commanding 1st Company:	Captain D. L. Dutton, C. A. C.
Commanding 2nd Company:	Captain E. W. Thomson, C. A. R. C.
Commanding 3rd Company:	Captain B. T. Ipock, C, A, C..

INSTRUCTORS

Captain W. B. Gilmore, C. A. R. C.
1st Lieutenant G. J. Loupret, C. A. C.
1st Lieutenant H. E. Ellis, C. A. C.
1st Lieutenant M. G. Cary, C. A. C.
1st Lieutenant H. J. Conway, C. A. C.
1st Lieutenant C. E. Hansen, C. A. C.

Arrival at Camp: All boats and trains were met and the arriving students taken to camp in government transportation, when they received their first meal as the guests of Uncle Sam. Next, the qualification cards were filled out and all men assigned to groups and companies. The medical inspection followed, and those who were found qualified to pursue the course outlined returned to the companies when they were taken to the supply room and drew their equipment.



1st Sergeant: Each company commander selected the most likely looking student to be the 1st Sergeant. His selection of course was governed by the amount of experience and education the candidate had.

Company Clerks: Each regular company in the Coast Defenses detailed a reserve clerk to act in this capacity in the student companies. During this time he was carried on SD by his own company. All of the company paper work which consists principally of reports on men is done by this clerk and the 1st Sergeant.

Cooks: Two reserve cooks from each regular company were detailed for duty with the student companies and carried on special duty by their own companies. The authorized number of cooks in a regular company makes it impossible to furnish rated cooks, so that in this instance the Coast Defenses were able to furnish men who had graduated from the Cooks and Bakers School but who did not actually hold the rating of cook.

Mess Sergeants: A regular sergeant, who was experienced in running a mess was detailed from the regular Coast Defense Companies to supervise the student company messes. Each student company had its own mess which was largely

run by the student mess sergeant who was selected for his special qualifications by the company commander as an assistant to the regular mess sergeant.

Mess: The value of the ration at camp was $0.70. This may seem a little high when compared with the allowance for regular companies, but it must be remembered that the student companies had no other source of income, and no company fund with which to "pad" the mess allowance. The value of a good mess in an enterprise of this kind cannot be over estimated. The contentment of the personnel depends largely upon the condition of the men. Furnishing quartermaster china for use instead of mess kits was a very wise and popular move.

Courtesy: Special stress was laid upon the rendering of salutes. Every phase of military courtesy was touched upon and the interest of each man aroused by careful explanations of the why and wherefor, which is usually quite vague in the minds of civilians. The origin and history of the military salute served to stimulate the pride and satisfaction of the student, when he realized that he was participating in a custom of the early ages. In conjunction with rendering salutes, neatness and presonal cleanliness were made a matter of personal pride with each man with the result that the general appearance of the personnel was all that could be asked for.

Artillery Drill: The first three days of drill, the men were rotated in the various gun positions and each man was given an opportunity to try his hand at every duty. This plan enabled the company commander to select and place men in the positions to which they were best suited.

Range Section: Obviously the work required of the range section is of a higher order than in the gun section. To enable the company commanders to select impartially men competent to serve on the range section, all members of the command took the Alpha Psychological Test and the men who made the highest rating were placed in the range section.

Officers: Training Camp duty is only one of the many demands for versatility in the regular army officer. The methods of handling the students is very much on a par with modern methods of industrial management, and consequently vastly different from straight duty with troops. Early in the game it was realized that courtesy, firmness and tact spelled success for the officer, and he who lacked these qualities, and was unable to acquire them was unsuited for such duty. The students were not governed by the Manual for Courts Martial and the Articles of War, but through an appeal to reason. The work at camp demands all of an officer's time. Each officer slept in camp and messed with his organization, which assured constant supervision and a knowledge of internal conditions.

Discipline: The necessity for some method of enforcing discipline and awarding punishment for minor offenses was of course felt. The plan adopted was the demerit system. At the beginning of Camp each man was given one hundred (100) merits, and for each offense he received a certain number of demerits. The maximum punishment was sending a man back to his home.

Supervision: Despite the fact that the law and consequently the schedule provided that all students would have the greater part of each afternoon to themselves, direct supervision was had at all time. This was really an ideal policy because the students were strangers in the camp locality and after the novelty wore off, they were at a loss to know how to put in their spare time. Colonel J. B. Mitchell hit upon the happy plan of offering sight seeing tours in government transportation. The points of interest to newcomers are the Navy Yard at Portsmouth, the Newport News Ship Yard and Langley Field. Each Company went to each place on successive week ends, where personally conducted tours were

held by the officials, civil or military, of the place visited. These trips were instructive and extremely popular with the students.

Sports: Baseball, track, and swimming were the three major sports. Each company had its own baseball team and a lively competition existed between companies.

Swimming was the more popular sport, and the conditions in camp were ideal. An area about 150 yards square was roped off, which marked the swimming limits for all bathers. Within this enclosure, two diving platforms were erected which were equipped with ladders and spring boards. A surf board was constructed which, when towed behind a motor yawl furnished thrilling sport for any who desired to ride.

Marches: The biggest physical test to which the students were subjected was the hike to Fox Hill and return, a distance of about twelve miles. The battalion left Fort Monroe at 8:30 in the morning of August 18 and was escorted as far as the Mill Creek Guard House by the Post Band. Arriving at Fox Hill, shelter halves were pitched and a parade was staged. Mess was served from rolling kitchens and the return trip was begun at 2:00 o'clock. Arriving at the Guard House again, the men were again met by the Band which escorted them back to camp with heads up and spirits high.

Funds: There were no funds. Every cent of the ration money was spent on food. There was no "overhead" and the quality of the mess benefitted accordingly. The "Day rooms" were furnished with phonographs and periodicals which were begged or borrowed from the Post. To Captain Bradshaw is due most of the credit for ferreting out all available material and appliances for the entertainment and diversion of the students.

Dances: Every Saturday night there was a dance for the students. Different societies in Hampton and Newport News furnished and chaperoned the girls who were brought to the dance and taken home in government auotmobiles. These dances have been very popular with both students and girls. They served as a bright spot in the week's routine and promoted cordial relations between students and the local civil population.

Morale: The morale in camp was very high. Every man went home with the conviction that the camp was a big success and with the high resolve that he was returning next year—and with him one or more of his friends.

Inspections: The camp was inspected by several notables among them: His Excellence E. Lee Trinkle, Governor of Virginia; Major General C. J. Bailey, 3rd Corps Area Commander; Brigadier General Martin and Colonel A. F. Cosby, National Executive Secretary, American Military Training Camps. All of these gentlemen were free in the praise of what the camp was doing. Colonel Cosby who had inspected many Camps and was in a position to judge, made a statement that the Fort Monroe Camp excelled all others he had visited.

Joint Coast Artillery and Air Service Training

A stride in the advancement of seacoast gun firing since the World War was inaugurated last March in the office of the Adjutant General when the Secretary of War directed that the Chief of Coast Artillery and the Chief of Air Service consider together the question of combining training in coast defenses and make joint recommendations with a view to experimenting in such training.

The potentialities of the Air Service in coast defenses became obvious during the World War and in joint Air Service and coast defense service practice subse-

quent to the war. It was possibly the feeling that the artillery was ignorant of the full scope of the airplanes services which resulted in the promulgating of these tests to determine the most efficient methods for the employment of the two arms in the coast defenses.

To bring out the possibilities and limitations of the two arms in joint operations, the Chief of Coast Artillery and the Chief of Air Service proposed the following program:

1. Conduct of fire.
   (a) Determination of relative suitability of airships, captive balloons and airplanes in conduct of fire.
   (b) Determination of ranges and conditions at which air observation is preferable to land observation.
   (c) Experimental work in control of fire at targets beyond the range of vision from shore.
2. Relative efficiency of aircraft attack and seacoast gun attack on naval targets within gun range.
3. Problem in joint coast artillery-air service operations in coast defense.
   (a) Development of information service.
   (b) Combined operations against a simulated naval attack.
4. Development of methods of training Anti-Aircraft Artillery.
   (a) Target practice at aerial targets, including determination of the effect of .50 cal. anti-aircraft machine gun.
   (b) Joint training in the use of anti-aircraft search-lights.

The coast artillery officers and the air service officers to whom the conduct of these tests was assigned have outlined a series of tests which largely embrace the recommendations of the two chiefs of the arms involved and in addition are taking advantage of this opportunity to try out various devices which are in the hands of the Coast Artillery Board for investigation and test. The outstanding features of this firing program which are all of paramount interest to the Corps are in substance as follows:

1. To decide definitely the possibility of firing at a moving target beyond visibility from shore with air observation.

2. To develop a system of terrestrial, balloon and aircraft spotting and determine the relative accuracy of each. (This test will offer the Coast Artillery Board the opportunity to try out some seven or eight different spotting devices and charts, whose relative accuracy, speed and adaptability to all conditions of firing will be determined.)

3. Put mortar battery and gun batteries in action for 20 minutes continuous firing as fast as they can load and lay accurately, the object being to determine the number of hits under battle conditions as compared with the bombing ability of an aircraft under the same conditions.

4. The air service to put down a smoke screen, obliterating the target and then acting as observers, furnishing sufficient data for the seacoast guns to fire on.

5. To determine the ability and accuracy of the air service in picking up and reporting the status of a fleet from time to time to the coast defense commander.

6. To check the observations of the air service by means of terrestrial devices and draw comparisons.

7. To determine if possible the ability of anti-aircraft artillery and anti-aircraft machine guns to hit aerial targets.

An interesting phase of one of the tests, the value of which is yet to be proven, is the method whereby the aircraft is to send the necessary data to the guns. The plan which has only been tentatively decided upon, is to supply the Battery Commander and the pilot of the aircraft with duplicate maps of the water area, on

which have been constructed grid systems of 1000 yard intervals. Each space thus formed is lettered and numbered. The battery position is located on the map and the aircraft "takes off" and heads for a position near the target. The pilot then plots the target on his map, the bearing of the target's course, and its speed, sending in the message in a form such as this: Z-NWW-12, which interpreted would mean, the target is in rectangle Z (on the map), is moving on a course NWW at a speed of 12 miles per hour. This information gives the battery commander a direction and a range from which he can figure a set forward point and predict, and it is on this data that the battery is fired. Needless to add, only the roughest approximations can be had from the airplane, consequently a range error of 1000 yards may not be surprising; with the proper correction applied to successive shots, this deviation will be reduced to a minimum. The element of danger is to be eliminated by locating two or more anchored targets to define a line intersecting a line extending from Fort Story in a direction ENE, at a distance from Fort Story not greater than ¾ of the maximum range of the 14" R. R. gun at Fort Story. A tug boat will tow the service target at a speed of 3 miles per hour on a course parallel to the line of targets and not to exceed 10,000 yards from Fort Story. The airplane from its position aloft will radio in the actual azimuth, speed and bearing of the course of the target, and the range the target would have if it were proceeding along the line indicated by the anchored targets. The track of the hypothetical target will be plotted, based on the airplane reports only and fire for adjustment begun. Range corrections to be made from the range deviations reported by the airplane which have been referred to the hypothetical course. Deflection of the line of fire being estimated and reported by a second plane assigned to that duty.

Another plan of airplane adjustment is to have the plane fly towards target, and when directly over head radio in suitable signals to terrestrial observers who have the theodolites centered on the plane. Assuming the plane directly over the target, the two azimuths of the plane, locate the true position of the target by plotting. This method is practically the same as the method tried out at Ft. Crockett in 1920 with some fair degree of success.

In determining the efficiency of the anti-aircraft artillery, it is proposed to give them firing under actual service conditions, that is, by enabling them to actually fire at an airplane. To do this, the self guiding airplane constructed by the Air Service may be brought down from Washington for this practice. This plane is equipped with a gyroscope attachment which permits the plane to climb to a certain pre-determined altitude and then reamin at that altitude, being guided in direction by radio. The landing of this plane will involve some degree of destruction and in order to minimize this, a water landing may be decided upon.

The outcome of these tests will be of universal interest. Whether or not it will be practicable to conduct all tests outlined when the time arrives, is still a matter of conjecture. However, such tests as are performed will be reported in full in the JOURNAL in the first issue after the completion of the tests.

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The Coast Artillery Rifle Team in the National Matches

The few selected officers and men of the Corps who composed the C. A. C. Rifle Team for this year have made a record of which we have every reason to be proud. Under the able instruction of Major W. S. Fulton and Captain W. W. Rhein, the team has made a record for itself in climbing from 29th place the first year, to 10th place the second, to 6th place last and *third* place this year. This

record is truly remarkable when it is realized that the small arms rifle is a secondary matter in the life of an artilleryman and yet despite this fact, our team enters the field against teams from branches who specialize in small arms, and comes out third.

On Wednesday Sept. 27 the C. A. C. team held first place through all of the different stages fired on that day. The scores stood, C. A. C. 1924; U. S. M. C. 1915; Infantry 1910; Cavalry, Engineers 1909; U. S. Navy 1907; and so on down the list of teams from many States both National Guard and civilian. These scores were the result of firing over the 200-yd. slow fire; 200-yd. rapid fire; 300-yd. rapid fire and the 600-yd. slow fire range. It was the fifth stage on the 1000-yd. slow fire range which proved our undoing; the final standing of the three leading teams was, U. S. M. C. 2848 out of a possible 3000; The U. S. Infantry 2836 and the C. A. C. 2824, only 24 points behind the winning team which defeated a field of 49 competitors. The following list of men composed the team which made this excellent showing:

Major W. S. Fulton ..... Team Captain
Capt. W. W. Rhein ..... Coach
Major W. D. Frazer ..... Member
Capt. J. A. Ryan ..... Member
Capt. J. T. Campbell ..... Member
Sgt. Jas. Wertzberger ..... Member
1st Lt. G. W. Trichel ..... Member
Mas. Sgt. Otto Hahn ..... Member
1st Lt. P. S. Lowe ..... Member
Sgt. G. B. Ping ..... Member
Capt. M. H. Parsons ..... Member
Sgt. Otto Bentz ..... Member

Of the twenty-one events with which the JOURNAL has been acquainted, it will be noted that the team members and other Coast Artillerymen who composed the squad hold conspicuous places. In the PRESIDENT'S MATCH. Capt. E. W. King, C. A. C. made first place with a score of 191 against 678 competitors and 1st Leiut. H. I. Borden third. In the INTERNATIONAL SMALL BORE TEAM, DEWAR TROPHY MATCH, the USA team took first place of which Capt. H. C. Barnes, Jr., C. A. C. was a member. In the MEMBERS MATCH, Capt. F. S. Swett, C. A. C. won fourth place against 619 competitors. In the MARINE CORPS MATCH, Pvt. J. J. Dyba, C. A. C., won first place against 590 competitors and fourth place in the 500 YARD RAPID FIRE PRONE against 520 competitors. In the NATIONAL INDIVIDUAL CHAMPIONSHIP MATCH, there was the closest finish in years, one Infantryman and two Coast Artillerymen shot their way through all stages of the course and successfully vanquished 800 contestants, each turning in the identical total score of 337 out of a possible 350. Previous records placed Sgt. Bentz 1st and Capt. Parsons 3rd. A list of the twenty-one events together with the standing and score of each Coast Artilleryman follows:

LEECH CUP MATCH: 589 ENTRIES

	Place	*Score*
Sgt. P. J. White, C. A. C.—Tyro Medal	17	103
Capt. E. W. King, C. A. C. " "	22	102
1st Lt. Kenneth Stice, C. A. C.	29	102
1st Lt. H. I. Borden, C. A. C.	43	101
Sgt. G. B. Ping, C. A. C.	46	101
Maj. S. W. Stanley, C. A. C.	48	101
Sgt. Otto Bentz, C. A. C.	49	101

Maj. W. D. Frazer, C. A. C.	52	101
Tech. Sgt. J. Christian, C. A. C.	59	101
Capt. H. C. Barnes, Jr., C. A. C.	62	101
Capt. E. F. Olsen, C. A. C.	63	100
Pvt. J. J. Dyba, C. A. C.	69	100
Capt. M. H. Parsons, C. A. C.	77	100
Capt. E. H. Stillman, C. A. C.	102	99
Maj. W. S. Fulton, C. A. C.	103	99
Capt. C. E. Loucks, C. A. C.	104	99
Sgt. Jas. Wertzberger, C. A. C.	115	98
Sgt. E. B. Porter, C. A. C.	116	98
1st Lt. P. S. Lowe, C. A. C.	126	98
Capt. F. S. Swett, C. A. C.	129	98
Capt. G. deL. Carrington, C. A. C.	146	97

MARINE CORPS MATCH. 590 ENTRIES

	Place	*Score*
Pvt. J. J. Dyba, C. A. C.—Gold Medal	**1**	**196**
Capt. G. deL. Carrington, C. A. C.—Bronze Medal	9	194
Capt. E. H. Stillman, C. A. C.—Tyro Medal	13	194
Mast. Sgt. O. S. Hahn, C. A. C.	23	193
Capt. F. S. Swett, C. A. C.	24	193
Sgt. Otto Bentz, C. A. C.	32	192
Sgt. Jas. Wertzberger, C. A. C.	33	192
1st Lt. L. A. White, C. A. C.	102	188
Maj. W. S. Fulton, C. A. C.	104	187
TYROS		
Capt. H. C. Barnes, Jr., C. A. C.	123	186
1st Lt. H. I. Borden, C. A. C.	131	186
Maj. C. W. Baird, C. A. C	141	185

PRESIDENT'S MATCH. 678 ENTRIES

	Place	*Score*
Capt. E. W. King, C. A. C.—Letter from Pres. of U. S.—Gold Medal and Gold Badge	**1**	**191**
1st. Lt. H. I. Borden, C. A. C.—Bronze Medal and Badge	3	191
Sgt. Jas. Wertzberger, C. A. C. " " "	6	189
Capt. A. C. Chesledon, C. A .C. " " "	8	189
1st Lt. G. W. Trichel, C. A. C.—Badge	14	188
Pvt. J. J. Dyba, C. A. C. "	17	188
Capt. J. T. Campbell, C. A. C. "	20	187
Capt. H. C. Barnes, Jr., C. A. C. "	22	187
Sgt. Otto Bentz, C. A. C. "	44	185
Sgt. G. B. Ping, C. A. C. "	45	184
Capt. W. W. Rhein, C. A. C. "	49	184
Maj. W. D. Frazer, C. A. C. "	62	183
Capt. M. H. Parsons, C. A. C. "	67	182
1st Lt. Kenneth Stice, C. A. C. "	74	182
Major W. S. Fulton, C. A. C. "	85	182
Capt. J. A. Ryan, C. A. C.	104	181
Sgt. E. B. Porter, C. A. C.	105	181
Capt. C. E. Loucks, C. A. C.	114	180
1st Lt. L. L. Lemnitzer, C. A. C.	116	180
Tech. Sgt. Jas. Christian, C. A. C.	137	179

Capt. E. H. Stillman, C. A. C.	140	178
1st Lt. L. A. White, C. A. C.	143	178
Capt. F. S. Swett, C. A C.	149	178
Capt. G. deL. Carrington, C. A. C.	156	178
Capt. E. F. Olsen, C. A. C.	161	178
Maj. L. F. J. Zerbee, C. A. C.	188	176

SMALL BORE RE-ENTRY COMPETITION. 100 YD. SWEEPSTAKES

	Place	*Score*
1st Lieut. Kenneth Stice, C. A. C.	7	?

MEMBERS' MATCH. 619 ENTRIES

	Place	*Score*
Capt. F. S. Swett, C. A. C.—Bronze Medal	4	50-7V
Sgt. O. H. Bentz, C. A. C.—Tyro Medal	15	50-4V
Maj. S. W. Stanley, C. A. C.	16	50-3V
Capt. E. H. Stillman, C. A. C.	37	49
Sgt. G. B. Ping, C. A. C.	44	49
Capt. M. H. Parsons, C. A. C.	48	49
1st Lt. G. W. Trichel, C. A. C.	53	49
Capt. J. A. Ryan, C. A. C.	63	48
Lt. L. A. White, C. A. C	79	48
Capt. E. F. Olsen, C. A. C.	82	48
1st Lt. P. S. Lowe, C. A. C.	83	48
Maj. C. W. Baird, C. A. C.	88	48
Capt. E. W. King, C. A. C.	101	48
TYROS		
Capt. A. C. Chesledon, C. A. C.	119	48
Capt. J. T. Campbell, C. A. C.	131	48

300 YARD RAPID FIRE. 580 ENTRIES

	Place	*Score*
Maj. S. W. Stanley, C. A. C.—Bronze Medal	3	50-18
Capt. H. C. Barnes, Jr., C. A. C. " "	10	50-18
1st Lt. P. C. Lowe, C. A. C.—Tyro Medal	13	50-17
Capt. J. A. Ryan, C. A. C.	18	50-16
1st Lt. G. W. Trichel, C. A. C.	20	50-16
Capt. M. H. Parsons, C. A. C.	25	50-15
Maj. L. F. J. Zerbee, C. A. C.	26	50-15
Maj. W. D. Fraser, C. A. C.	29	50-15
Maj. W. S. Fulton, C. A. C.	37	50-14
1st Lt. L. L. Lemnitzer, C. A. C.	47	50-13
Capt. J. T. Campbell, C. A. C.	71	50-39
Capt. W. W. Rhein, C. A. C.	82	49
Sgt. G. B. Ping, C. A. C.	105	49
TYROS		
Capt. G. deL. Carrington, C. A. C.	112	49
Capt. F. S. Swett, C. A. C.	119	49
Maj. C. W. Baird, C. A. C.	120	49
Sgt. E. B. Porter, C. A. C.	134	49
Mast. Sgt. O. S. Hahn, C. A. C.	148	49

ENLISTED MEN'S TEAM. 24 TEAMS ENTERED

	Place
Coast Artillery Corps	5

CAMP PERRY INSTRUCTORS' MATCH. 125 ENTRIES

	Place	Score
Sgt. E. B. Porter, C. A. C.—Tyro Medal.	13	132
Tech. Sgt. Jas. Christian, C. A. C.	17	132
Maj. W. D. Fraser, C. A. C.	25	130

CHAMPION REGIMENTAL TEAM MATCH. 26 ENTRIES

	Place
District of Columbia, N. G.	1
U. S. Marine Corps	2
C. D. of San Francisco	3

200 YARDS RAPID FIRE. 577 ENTRIES

	Place	Score
Sgt. E. B. Porter, C. A. C.	12	50-49-48
1st Lt. L. L. Lemnitzer, C. A. C.	29	50-48
Pvt. J. J. Dyba, C. A. C.	32	50-48
Capt. J. T. Campbell, C. A. C.	40	50-48
Capt. E. F. Olsen, C. A. C.	47	50-47
1st Lt. G. W. Trichel, C. A. C.	50	50-47
Capt. A. C. Chesledon, C. A. C.	59	50-47
Sgt. P. J. White, C. A. C.	71	50-47
Maj. W. D. Frazer, C. A. C.	74	50-46
Capt. H. C. Barnes, Jr., C. A. C.	82	50-46
Sgt. G. B. Ping, C. A. C.	85	50-45
1st Lt. P. S. Lowe, C. A. C.	106	50-45
1st Lt. H. I. Borden, C. A. C.	115	50-44
Sgt. Jas. Wertzberger, C. A. C.	123	50-43

500 YARDS RAPID FIRE. (PRONE) 520 ENTRIES 10 SHOTS

	Place	Score
Pvt. J. J. Dyba, C. A. C.—Bronze Medal	4	50
Capt. H. C. Barnes, Jr., C. A. C.	18	49
Sgt. E. B. Porter, C. A. C.	19	49
Maj. L. F. J. Zerbee, C. A. C.	31	48
Sgt. Otto Bentz, C. A. C.	36	48
Sgt. Jas. Wertzberger, C. A. C.	40	48
Maj. S. W. Stanley, C. A. C.	44	48
Capt. J. A. Ryan, C. A. C.	77	47
1st Lt. Kenneth Stice, C. A. C.	83	47
Maj. W. D. Frazer, C. A. C.	95	46
1st Lt. H. I. Borden, C. A. C.	105	46
Capt. E. H. Stillman, C. A. C.	116	46
Mast. Sgt. O. S. Hahn, C. A. C.	127	46
Capt. M. H. Parsons, C. A. C.	129	46

OFFHAND MATCH (200 YARDS STANDING) 500 ENTRIES

	Place	Score
Capt. E. J. King, C. A. C.	20	92
Sgt. Otto Bentz, C. A. C.	26	91
Capt. E. F. Olsen, C. A. C.	28	91
Mast. Sgt. O. S. Hahn, C. A. C.	34	91
Sgt. Jas. Wertzberger, C. A. C.	53	90
Capt. H. C. Barnes, Jr., C. A. C.	70	89
1st Lt. G. W. Trichel, C. A. C.	71	89
Sgt. G. B. Ping, C. A. C.	74	89

TYROS

Pvt. J. J. Dyba, C. A. C.	100	88
Capt. M. H. Parsons, C. A. C.	108	88
Capt. A. C. Chesledon, C. A. C.	115	88

A. E. F. ROUMANIAN TROPHY MATCH. 22 ENTRIES

	Place
Coast Artillery Team	5

NATIONAL INDIVIDUAL RIFLE MATCH. 780 ENTRIES

	Place	*Score*	*Award*
Sgt. Otto Bentz, C. A. C.	**1**	**337**	(Gold Badge)
Capt. M. H. Parsons, C. A. C.	3	337	(Gold Badge)
Capt. J. T. Campbell, C. A. C.	15	334	(Silver badge)
1st Lt. G. W. Trichel, C. A. C.	20	333	(Silver Badge)
Maj. W. D. Frazer, C. A. C.	22	333	(Silver Badge)
Capt. H. C. Barnes, Jr., C. A. C.	40	332	(Bronze Badge)
Maj. S. W. Stanley, C. A. C.	50	331	(Bronze Badge)

ALL-AROUND CHAMPIONSHIP. 41 ENTRIES

	Place	*Score*	*Award*
Maj. W. D. Frazer, C. A. C.	**1**	**880**	Gold Medal

CAMP PERRY SHOT GUN CHAMPIONSHIP. 17 ENTRIES

	Place	*Score*	*Award*
Maj. W. D. Frazer, C. A.. C.	5	81	Bronze medal

UNITED SERVICE MATCH

The U. S. Army team winning second place with four C. A. C. principals and two alternates.

HERRICK TROPHY MATCH. 29 ENTRIES. 800-900-1000 YDS. PRONE.

Coast Artillery Team winning third place with the service rifle, and having a score at 1000 yards equalling the winning team whose rifles were equipped with telescopic sights.

SPECIAL 200 YARD FREE RIFLE MATCH. 98 ENTRIES

	Place	*Score*
1st Lt. G. W. Trichel, C. A. C	2	93
Mast. Sgt. O. S. Hahn, C. A. C.	5	91

N. R. A. RAPID FIRE MATCH

	Place	*Score*
Capt. H. C. Barnes, Jr., C. A. C.	9	149
Major L. F. J. Zerbee, C. A. C.	13	147

SPECIAL 600 YARD FREE RIFLE MATCH. 108 ENTRIES. 600 YDS. PRONE

	Place	*Score*
1st Lt. Kenneth Stice, C. A. C.	8	99
1st Lt. G. W. Trichel, C. A. C.	10	99
Sgt. E. B. Porter, C. A. C.	22	98
Tech. Sgt. J. Christian, C. A. C.	28	97

RESULTS OF TRY OUT FOR IINTERNATIONAL DEWAR SMALL BORE TEAM.

	Place	*Score*
Capt. H. C. Barnes, Jr., C. A. C.	24	761
1st Lt. Kenneth Stice, C. A. C.	29	758

Note: Twenty-five men selected for final tryout. Team consists of twenty members.

WIMBELTON CUP MATCH. 78 ENTRIES "ANY RIFLE"; 497 ENTRIES "SERVICE RIFLE"

"SERVICE RIFLE"

	Place
Capt. J. A. Ryan, C. A. C.	18
Capt. E. H. Stillman, C. A. C.	95
Sgt. G. B. Ping, C. A. C.	110

"Any Rifle"

		Score
Capt. H. C. Barnes, Jr., C. A. C.	Bronze Medal 2	100
Tech. Sgt. J. Christian, C. A. C.	" " 6	99
1st Lt. G. W. Trichel, C. A. C.	" " 10	99
Sgt. E. B. Porter, C. A. C.	Tyro " 17	98

Note: The Bull's Eyes at 600 yards contain an inner circle 12 inches in diameter. At 800-900 and 1000 yards the inner circle is 20 inches. *Shots striking in this inner circle are scored V.*

THE COAST ARTILLERY PISTOL TEAM

Major W. D. Frazer, C. A. C.	Member
Capt. A. C. Chesledon, C. A. C.	Member
Capt. H. C. Barnes, Jr., C. A. C.	Member
Tech. Sgt. J. Christian, C. A. C.	Member
Sgt. E. B. Porter, C. A. C.	Member
Major C. W. Baird, C. A. C.	Alternate
Major W. S. Fulton, C. A. C.	Alternate

NATIONAL PISTOL TEAM MATCH. 11 ENTRIES

	Place
Coast Artillery Corps	4

NATIONAL INDIVIDUAL PISTOL MATCH. 119 ENTRIES

	Place	*Score*	*Award*
Tech. Sgt. J. Christian, C. A. C.	13	247	Silver Badge
Maj. W. D. Frazer, C. A. C.	14	246	Silver Badge
Maj. S. W. Stanley, C. A. C.	15	244	Silver Badge
Sgt. E. B. Porter, C. A. C.	38	237	Bronze Badge
Lt. W. L. Wallace, C. A. C.	43	235	Bronze Badge
Pvt. J. J. Dyba, C. A. C.	55	231	Bronze Badge

✤ ✤ ✤

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F-10	Revue d'Artillerie
F-16	Journal de la Marine, Le Yacht
G-5	Militar Wochenblatt
I-4	Rivista Marittima
M-2	Revista del Ejercito y Marina
Sp-0.5	Le Guerra y su Preparacion
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UK-8	Engineer
UK-9	Engineering
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US-48.5L	Outlook
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Investigation of Semi-steel Shell.—*US-7.5*, May-June, 1922.

ANTI-AIRCRAFT DEFENSE

Anti-Aircraft Machine Gunnery. Part II—Anti-Aircraft Sights and Range-Finding.—*US-7.5*, May-June, 1922.

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Las Fuerzas Militares del Japon en 1921. Artilleria.—*Sp-2*, April, 1922.

Les Possibilites Militaires Actuelles de L'Allemagne.—*F-10*, May, 1922.

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Air Forces and British Empire Defense.—*US-48.5L*, June 14, 1922.

Influence in the Future of Aircraft Upon Problems of Imperial Defense, The.—*UK-13*, May, 1922.

Some Aspects of the Work of the Royal Air Force with the B. E. F. in 1918.—*UK-13*, May, 1922.

BALLISTICS

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Development of Accurate Ammunition, The.—*US-65*, August, 1922.

Notes on Interior Ballistics.—*US-7.5*, May-June, 1922.

Revue des publications italiennes recentes sur la balistique rationnelle. IV.—*Be-4*, June, 1922.

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Light Field Howitzer, The.—*US-7.5*, July-August, 1922.

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Washington Conference Influence on Warship Design.—*UK-9*, July 7, 1922.

ORDNANCE CONSTRUCTION

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Electric Gun Shrinking Furnace, The.—*US-7.5*, July-August, 1922.

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Rifling of Cannon.—*US-7.5*, July-August, 1922.
St. Chamond Recoil Mechanism, The.—*US-7.5*, July-August, 1922.

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El Reglutamiento del Ejercito Ingles.—*Co-1*, January-February, 1922.
Infantry Organization—An Experiment in War.—*US-30*, June, 1922.
"Militaerkommissionens" Betaenkning og Regeringens Forsvarslove.—*D-0.5*, May, 1922.

SUPPLY

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BOOK REVIEWS

AVIATION

The Airplane. By Frederick Bedell, PH. D., D. Van Nostrand Company, New York. 1920. 6½" x 9½". 257 pages. Price, $3.00.

This book contains one of the most excellent presentations of the principles of airplane flight ever published. In it the author approaches the more difficult problems in a most logical manner, leading the reader step by step through the first seven chapters.

The first chapter deals with the fundamental subject of sustentation. In this chapter the author passes naturally from a discussion of the effect of the air stream upon a flat plane at various angles of presentation, to the variations in this effect upon cambered surfaces.

The basic formulae dealing with the fundamental L/D (Lift over Drag) ratio are clearly explained.

In the succeeding chapters, II to VII inclusive, the subjects "Relation in Flight" "Resistance," "Thrust Required," "Power Required," "Power Available," and "Relation between Power Required and Power Available" are clearly discussed with numerous easily understood diagrams.

By the time the reader reaches Chapter VIII he has a clear understanding of the basic principles and has no difficulty in following the author through his discussions in Chapters VIII to XIII covering "Climbing and Gliding", "Airplane Performances at Different Altitudes", "Single and Multiple Planes", "Longitudinal Stability," "Lateral Stability' and "Directional Stability."

Altogether the book is the most logical presentation of the subject that the reviewer has seen. It is so well presented that it is intensely interesting and easily understood although scientifically accurate and fairly complete.

Dynamics of the Aeroplane. By Rene Devillers. Translated by Captain Wm. J. Walker, Royal Air Force. London. E. & F. N. Spon. 1922. American Agents, Spon and Chamberlain. New York. 5½" x 8¾". 302 pp. Price, $4.50.

This work is not a theoretical treatise on rigid mechanics but a condensed presentation of experimental data in the simple technical form which permits of its immediate use. The method of treatment is not encyclopedia-like, nor is it designed for the beginner in aeronautics, rather for the student who is conversant with this science, and the engineer. It is perhaps the first book on the dynamics of an airplane in English in which the nomographic form is used throughout.

The fundamental principle underlying the construction of nomographic or alignment charts involves the graphical representation of an equation in three variables, by the use of three scales (on straight lines or on curves) so that a straight line cuts the three scales at values of the three variables that will satisfy the given equation. Professor D'Ocague is credited with having introduced the use of the tangential coordinates which have made the construction of alignment charts practicable.

In translating this book Captain Walker was confronted with the additional labor of reconstructing these charts in order to change from French to English units. The following is a sample of the kind of problem that is solved by means of a nomogram. A machine weighing 4400 lbs. carries 770 lbs. of bombs; it flies at 13,200 ft., the altitude representing, say, the practical ceiling of the machine thus loaded. The machine, after release of the bombs, will not weigh more than $4400-770=3630$ lbs. Required to find the new altitude at which the machine will fly under the same conditions as before. By means of the chart the altitude is found to be 18,200 ft. Another example: A machine has a ceiling of 23,000 ft. and weighs 8.5 lbs. per H. P. What ceiling velocity will it have? The chart gives 150 ft. per sec. or 100 miles per hr. (approx.).

ENGINEERING AND SCIENCE

Trautwine, The Civil Engineers Pocket-Book. By John C. Trautwine, C. E. 20th Edition. Trautwine & Co., Philadelphia. 1922. 4½" x 6½". 1609 pp. Flexible leather.

The 20th edition of the famous TRAUTWINE maintains the superior qualities of the previous issues. A complete revision and the addition of many important subjects has only increased its size slightly whereas its value has been

greatly enhanced. The outstanding features are its thoroughness and its simple wording which are explained by the prefatory remarks that "comparatively few engineers are good mathematicians * * and that the book is prepared expressly for the younger members of the engineering profession."

Considering the various demands upon an artilleryman, this book with its complete and accurate tables, its treatment of all phases of mathematics and mechanics, and its chapter on railroads, will be of inestimable value to him.

Electric Cables. By Francis W. Main. Isaac Pitman and Sons. New York. 1922. 4" x 6½". 101 pp. Profusely illustrated. Price, $0.85.

This practical treatise on the construction, properties, installation and maintenance of electric cables is designed for junior engineers, students and those in charge of works and factories. It is one of the series of Pitman's Technical Primers, and, although it is merely an outline of the subject, it gives a clear and straight-forward account of the essentials for the student and non-specialist.

The contents include a chapter on each of the following:—service functions and requirements, essential parts of a cable, cable construction, selection of types and methods of laying, systems of power transmission and types of cable, properties and dimensions of conductors and dielectrics, quantities, and testing and maintenance.

The illustrations are varied and well-done, the addition of tables and a bibliography and index, making it a valuable little outline.

Genetics. By Herbert E. Walter. The Macmillan Co. New York. 1922. 5¼" x 7¾". 354 pp. Pro. Ill. Cloth.

This is a revised edition of a work originally published in 1913. The book is concerned with the presentation for the non-technical reader of the biological foundations of heredity. Necessarily in its presentation of the essential considerations of species, the germination and propagation of life, variation, mutation, acquired characters, selection, the factor hypothesis and so on, the author has to have recourse to a great deal of technical terminology and to many pages of exposition of the experimental methods by which biologists have arrived at the accepted theories concerning heredity, many of which, while arrived at by observation of the lower forms of life, have their application to human heredity.

At the present time the student of sociology and kindred subjects who is not at the same time a biologist is constantly running across references to Mendelism and the Mendelian Law. Such a person will be especially pleased to find in Chapter V of the present work a concise and satisfactory account of the work of Mendel and of the experiments by means of which he arrived at the theory which is referred to as the Mendelian Law.

Many parts of the book are really hard reading, requiring careful concentration, but to the non-biologist who cares to make a sound approach to an understanding of the principles of heredity this work is heartily to be recommended.

Manufacture and Uses of Explosives. By R. C. Farmer. Isaac Pitman and Sons. New York. 1921. 4¼" x 6½". 116 pp. Profusely illustrated.

On opening this little book, that which immediately holds the eye and arouses the curiosity is the frontispiece. It shows a diagram very like a genealogical tree, the word COAL standing out in heavy capitals. From one of the main boughs marked coal tar, extend branches, labeled benzene, toluene, napthalene, phenol; and from these branches extend lesser branches, nitro-benzene, chlorobenzene; and from these lesser branches twigs stretch out, having such names as

dinitro-benzene, aniline; and finally, from these twigs, still smaller twigs reach out, with such names as tetranitro-aniline and hexanitro-azobenzene. The derivation of high explosives and their components from coal distillation products. Could there be any physical phenomenon more complex, more wonderful and more mysterious to the uninformed?

Dr. Farmer's little text, one of the Pitman Technical Primers Series, treats of the fundamentals of the manufacture and uses of explosives, such as gunpowder, nitrocellulose, nitroglycerine, picric acid, trinitrotoluene, mixed explosives, detonators and fireworks. The book, is designed for chemists, ordnance officers, mining engineers, and students. It describes the uses, the behavior and tests, as well as the most approved methods for manufacturing and purifying explosives, clearly and interestingly.

The New Heavens. By George Ellery Hale. Charles Scribner's Sons. New York. 1922. 5¼" x 7¾". 88 pp. Price, $1.50.

Dr. Hale, director of the Mount Wilson Observatory, whose interesting volume, *The Study of Steller Evolution*, published in 1908, made such a wide appeal, has again produced a summary of the latest achievements in astronomy.

This new book embraces three articles recently contributed to Scribner's Magazine, entitled,—The New Heavens, Giant Stars and Cosmic Crucibles. The author dwells at length on the new one hundred-inch telescope at Mount Wilson and the spectroscope, because of the many new factors which they have brought into the determination of the dimensions and composition of celestial bodies. The mirror of this giant telescope is large enough to collect 160,000 times the light received by the eye.

This little text which is written for the layman, in untechnical language, is beautifully illustrated, is fascinating as well as profoundly interesting.

Technical Exposition. By Karl O. Thompson, A. M. Harper and Bros. New York. 1922. 5¼"x 7¾". 231 pp. Price, $1.75.

This textbook on the application of exposition to technical writing covers the more practical aspects of the instruction in English, and is designed for students in scientific, agricultural and engineering colleges. It is the outgrowth of courses intended to prepare the students for the particular type of reading and writing they will be called upon to do in their daily work. Such courses the author has given for the past ten years.

The author's method of treatment is to consider technical exposition under two headings—the method of definition, and the method of analysis. Particularly notable is the care with which he prepared the exercises that are appended to every chapter.

In showing how the study of technical exposition may be made interesting, the author's ideas are so clear and persuasive that they virtually insert themselves into one's thoughts and immediately begin to function.

THE MILITARY ART

La Défense Des Frontières Maritimes. By Captaine de Corvette J. Avice. Augustin Challamel. Paris. 1922. 6¼" x 9¾". 185 pp. Paper.

Based upon the premises that the maritime frontier of Continental France will always be secondary to the terrestrial frontier as an object of enemy attack in force, and that, landing attacks on any appreciable scale no longer being feared, the defense of the seacoast becomes in essence the defense of naval and commercial

bases—these premises are developed in the text by an interesting account of historical and recent evolution—the author concludes that the responsibility of safeguarding the sea front should devolve upon the Navy ("It is needless to say that, if the Navy were to be so derelict as to permit the enemy to penetrate in force into the interior, the Army would be under the necessity of establishing a new land front"—the Army thus forming a second line of defense against seaward attack) and that the Navy should control, as should the Army, all elements of defense necessary in order that it may carry out its mission.

A noteworthy indication in the development of the author's thesis is that French thought and feeling are becoming more and more continental and that she has consequently given up all idea of becoming a "sea power." A most valuable portion of the book—to a military reader at least—is the chapter devoted to a comparison of the dispositions for coast defense adopted by the United States, Japan, and the important European nations.

Development of Tactics—World War. By Lieutenant General Balck, German Army. Translated by Harold Bell. Fort Leavenworth, Kansas. General Service Schools Press. 6¼" x 9¼". 295 pp. 18 il. Price, $2.00.

Written by one whose reputation as an authority on pre-war tactics was very high and whose experience in the war as Lieutenant General in the German Army gave him opportunity to analyze accurately applications and developments of pre-war conceptions, this book is probably the most thorough and correct analysis yet provided for the student of tactics.

Approaching his subject in successive phases, geographic, chronologic and purely tactical there are inevitable repetitions. These however serve to impress on the student's mind those principles by which Balck himself had been most deeply impressed. Apparently chief of these was the development of the "elastic defense" although the author fails to quote specifically as an illustration the employment of it by General Gouraud in July 1918, east of Rheims.

The analysis of mountain fighting, the possibilities and limitations of both attack and defense in such country as the Tyrol, is covered briefly but very clearly. This chapter is one of the most lucid of the volume.

From extracts from captured or surreptitiously obtained documents it is apparent that the Germans were more successful in their espionage among the French than among the English.

While in the main the book is limited strictly to tactics, the author diverts on two points. He from time to time pungently and apparently quite fairly criticizes the merits and demerits of Germany's allies and occasionally, particularly in regard to employment of gas he becomes a special pleader and attempts to put the onus for originating the use of gas on the French and English.

The book suffers in its translation. In many places the, to us, awkward invertions of German phraseology have been retained and in many places, particularly in the first section of the book, the exact meaning is not clear.

HISTORY AND POLITICAL SCIENCE

Our Navy at War. By Josephus Daniels. George H. Doran Co. New York. 1922. 6" x 9". 390 pp. 64 Ill. Cloth. Price, $3.00.

No one was in a more favorable position to write an authoritative account of the many and varied activities of our Navy, both at home and abroad, than Josephus Daniels. As Secretary of the Navy from 1913 to 1921 and one of the outstanding figures of the Wilson administration, he was thoroughly equipped to do justice to the not unpleasant task of setting down in print the narrative of "Our Navy at War."

The most interesting feature of the book is the account of the events leading up to the laying of the famous "Northern Barrage." Mr. Daniels gives the following account:

"The Bureau of Ordnance on April 15, 1917, submitted a memorandum urging that we stop the submarines at their source and suggesting that mine barriers be laid across the North Sea, the Adriatic and the Dardanelles. Next day I cabled Admiral Sims, who had just arrived in London: Is it not practicable to blockade German Coast efficiently and completely, thus making practically impossible the egress and ingress of submarines? The steps attempted or accomplished in this direction are to be reported at once.

"Two days later came this answer: To absolutely blockade the German and Belgian coast against the entrance and departure of submarines has been found quite unfeasible.

"The next day he wrote a long letter, amplifying the difficulties and reporting against any such barriers. But our Ordnance experts were thoroughly convinced the project was feasible. On May 2nd, they outlined their plans in a memorandum to be submitted to the British Admiralty, and on May 11th I cabled Admiral Sims: Much opinion is in favor of concerted efforts by the Allies to establish a complete barrier across the North Sea, Scotland to Norway, either direct or via the Shetlands, to prevent egress of German submarines. * * * * Two days later came the reply: From all experiences, Admiralty considers project of attempting to close exit to North Sea to incoming submarines by the method suggested to be quite impracticable. Project has previously been considered and abandoned.

Earle and his associates in the Bureau of Ordnance never doubted final success. They experimented with mines, * * * and on July 30th announced the development of a new type of mine, particularly adapted to deep waters. A unique feature of this mine was that it did not have to be struck to explode, but would explode if a submarine passed close to it. * * * With this improved mine as an argument, our ordnance experts renewed the proposal of a mine offensive in the North Sea. * * * Finally, on October 22nd, an answer direct from the British Admiralty said: Admiralty has approved mine barrier and now confirms approval."

In another part of his book, Secretary Daniels quotes from the testimony of Admiral Strauss before the Senate Investigating Committee as follows:

" * * * After all the objections were presented to him, Admiral Strauss, when asked if he still considered it would have been feasible to have gone about with the mine barrier in 1917, unhesitatingly answered Yes."

Mr. Daniels then sums up as follows:

"Not laying that barrage earlier—in fact, at the earliest possible moment—was, in my opinion, the greatest naval error of the War. If the British had erected it earlier in the War, and put a similar barrier across the Straits of Dover and Otranto, the Germans would have been so restricted that wide-spread U-boat warfare, with its terrible destruction of life and shipping, would have been impossible."

In this connection, it is only fair to Admiral Sims to give his side of the now famous controversy That can best be done by quoting from his book.

Admiral Sims, in his "The Victory at Sea," gives this account:

"Most newspaper critics assumed that the barrage from Dover to Calais was keeping the submarines out of the channel. * * * The mines and nets * * * did not offer an effective barrier to the submarine. This was due to various reasons, too complicated for description in a book of this untechnical nature. * * * To have started the North Sea barrage in the Spring and Summer of 1917 would have meant abandoning the convoy system; and this

would have been sheer madness. * * * We did not have a mine which could be laid in such deep waters in sufficient numbers to have formed any barrier at all. * * * Presently the situation began to change. The principal fact which made possible this great enterprise was the invention of an entirely new type of mine. * * * We Americans may take pride in the fact that it was an American who invented an entirely new type of mine and therefore solved this difficulty. * * * Its great advantage was that it was not necessary for the submarine to strike the mine in order to produce the desired explosion. This mine could be located at any depth, and from it a long antenna, a thin copper cable, reached up to within a few feet of the surface, where it was supported in that position by a small metal buoy. Any metallic substance, such as the hull of a submarine, simply by striking this antenna at any point, would produce an electric current, which, instantaneously transmitted to the mine, would cause this mine to explode. The great advantage of this device is at once apparent. Only about one-fourth the number of mines required under the old conditions would now be necessary. * * * Another circumstance which made the barrage a feasible enterprise was that by the last of the year 1917, it was realized that the submarine had ceased to be a decisive factor in the War. It still remained a serious embarrassment, and every measure which could possibly thwart it should be adopted. * * * Therefore, on November 2, 1917, the so-called North Barrage project was officially adopted by both the American and British governments."

Mr. Daniels has gathered together a mass of information, so that his book is virtually a chronology. Despite the array of facts and figures, he has made his work a pleasing and interesting narrative.

American Democracy. By Willis Mason West. Small Maynard and Company. Boston. 1922. 5¾" x 8¾". 791 pp. Profusely Ill. Cloth. Price, $4.00.

The typographical style of this work, with its free use of side headings, the numerous illustrations and sketch maps, together with the method of treatment by the author, suggest the intended use of the work as a text book of American History, in high schools and colleges. A study of the book indicates that it is admirably adapted for such a purpose, and also reveals the radical departure from the conventional handling of materials from that common in the usual text book of American History.

Beginning with the earliest colonization of America by the English, the Spanish, and the representatives of the other nations who took a lesser part in the opening up of the New World, the book proceeds with an examination of the events in American History up to and including the Post-World War period, treated in a manner to lay emphasis on the economic, geographic and political influences which served to develop or retard the essential features of our American Democracy. The reader will be impressed with several distinct results of this method. In the first place, the accounts of the various periods which have included the numerous wars in which the United States has been engaged, are almost devoid of detailed exposition concerning individual battles, campaigns, forces engaged and military and naval leaders. At the same time there is far greater attention paid than in the usual history to the political considerations and efforts underlying and affecting the causes and progress of our wars. The author pays great attention to matters of social status, economic condition, education and political method throughout our history. In a significant way the labor movement is traced from its beginnings in the early part of the 19th century, and full attention is paid to the struggle

since the Civil War between "privilege" and progressive force, and between Capital and Labor.

The discussion of the events leading up to the adoption of the constitution is typical of the manner in which Professor West is intent on showing the petty motives and ignoble considerations which have had their share in influencing the development of all our practices and institutions. Indeed, it is just this quality of courage in calling a spade a spade and in presenting the unlovely as well as the noble traits in American economic and political life which render this book valuable as a text for the young student and which should recommend it for wide and profitable use.

What Happened at Jutland, The Tactics of the Battle. By Comdr. C. C. Gill, U. S. N. The George H. Doran Co. New York. 1921. 6¾" x 9 3/8". 187 pp. 26 diagrams. Price, $3.00.

The battle of Jutland furnishes the only example of the clash of fleets composed of modern warships of the different classes. The account of it that appeared in the press shortly after its conclusion electrified the world. The controversy that immediately ensued absorbed our attention. We have had accounts of the battle written by the commanders of each of the opposing fleets not long after the action, as well as by others of the nations involved. But it has remained for Commander Gill to prepare the first authentic non-partisan discussion of the tactics of this great battle.

Following a brief statement of the strategy involved, the discussion of the tactics is entered upon and here are brought out the events immediately prior to and leading up to the engagement. The author delimits five separate phases of the battle and proceeds to analyze each of these in succession. Diagrams show the ships engaged in each phase, their formations and the courses run. An analysis of strategic results brings the volume to an end. There are two appendices: the first setting forth the losses and damage incurred; the second consisting of extracts from Admiral Taylor's paper on the "Design of Warships as Affected by Jutland."

This study is based upon the official documents obtained from Admiralty records of each of the participants. Their despatches and reports are now available and the author has made good use of them. As a consequence, we now have an accurate and impartial analysis of this important action. The book is well written, ably arranged and comprehensive.

The Building of An Army. By John Dickinson. New York. The Century Co. 1922. 5½" x 8". 390 pp. Cloth. Price, $3.00.

When the military policy of the United States is being studied, the student must read this volume to enable him to digest the policy covering the period from 1917 to 1920. In opening, Mr. Dickinson tells us "The purpose of this book is to tell the story of the building of an Army; to describe the process by which the United States, with a regular military force of but one hundred thousand men on April 1, 1917, succeeded by November 11, 1918, in placing more than three million men under arms. * * * It is the story of the procuring and the assembling of the human material out of which the Army was built, and of its fashioning into an organized instrument of warfare."

From this, the author proceeds to a short resumé of our military policy directing special attention to the latent defects of the period immediately preceding that under discussion. The imminent possibility of participation in the World War largely contributed to the passage of the National Defense Act of June 3, 1916.

After setting forth its principal provisions, its incapacity in the face of the emergency caused by American entry into the World War is demonstrated. The author then is well launched on his subject. He discusses the provisions and details of operation of the Selective Service Act; outlines the general organization of the one Army; and sets forth the advanced methods evolved in the care and handling of the great mass of men inducted into the Service. A good account of the evolution of the General Staff is carried through from the beginning of the Twentieth Century to the passage of the Army Act of 1920. Conditions surrounding the passage of this latter Act are expounded, while a general discussion of the essentials of American Army policy completes the volume.

This book is a serious study and is not to be mistaken for light reading. It may be too intricate and not direct enough for use as a text but certainly it is a reference work of the highest order. I know of no other book where such precise information concerning this subject can be obtained in one volume or in such readable form. Include this book in your list and add it to your library without delay. But do not stop there, read it when it comes. Few of us now are as familiar with the subject under discussion as we would be and the careful reading of Mr. Dickinson's volume will set us right.

Money. By D. H. Robertson. Harcourt, Brace and Co. New York. 1922. 5″ x 7½″. 182 pp. Cloth.

The present volume is the second in the Cambridge Economic Handbook Series, of which the first volume *Supply and Demand* was reviewed in the September issue of the JOURNAL. *Money* even more than its predecessor is a distinctiy enjoyable textbook, due to a pervasive sense of humor which is reflected throughout the book in the author's expression of the technical considerations involved in the employment of money. Quite naturally the references and examples which the author frequently employs pertain primarily to the financial system of Great Britain and to the banking methods in vogue in England, which differ in radical particulars from the banking system in the United States. Nevertheless, the author is well aware of these differences and his references to American practices are sufficient to enable the American student to make a clear application of the principles set forth to conditions in the United States.

In a fresh and original manner the author does not hesitate to inject his own bias throughout the presentation of all of the subjects covered by the book, which include the merits and drawbacks of money, the value of money, the quantity of money, money and price level, the War and the price level, the question of the standard, the foreign exchanges and monetary policy. It is hard to pick out for especial comment in a short notice all the significant features of the book, but particular mention should be made of his presentation of the argument that an ever increasing price level is not only unavoidable and inevitable, but is indeed much to be desired for the benefit of nearly all classes of people. The work may be said to be particularly useful at the present time in the clear cut picture which it presents of the reasons for the present financial instability throughout the world.

The Immigration Problem. 5th Edition. By Jeremiah W. Jenks, Ph.D., L.L. D. and W. Jett Lauck. Funk and Wagnalls Co. New York. 1922. 5½″ x 8″. 655 pp. Cloth. Price, $3.00

This work, which is truly monumental in its inclusiveness, may justly be styled the standard manual of reference on American immigration. The careful reader will be impressed particularly in two ways as he studies this book. First, he will appreciate that the deductions and conclusions arrived at are the result of the statistical method of investigation, and are not the product of *ex parte* theorizing.

The importance of this fact can hardly be overstated, in view of the diverse and wild flood of opinion concerning the effects of immigration on American life which has been flowing through press and platform for several years. Indeed, to a large extent the reader is free from the necessity of depending upon the conclusions of the authors, for the book fairly bristles with statistical tables and charts, besides including a separate section of a hundred pages devoted wholly to the texts of laws, reports and statistical tables, all of which may properly be considered as original reference material, which the reader may interpret as he will.

In the second place, the serious student cannot fail to be impressed with a conviction that the presentation of the facts concerning immigration does not justify the prevalent pessimism voiced so generally today, not only in the so-called "literature of despair," but even in the more robust writing of publicists and editors. A very great value of the book lies in the fact that while it presents soberly the dangers and problems resulting from immigration, yet it equally dispels the bogies of immigration.

King's Complete History of the World War. Edited by W. C. King. The History Associates. Springfield, Mass. 1922. 7½" x 10¾". 754 pp. Cloth. Price, $5.40.

A popular history of the War, written in a distinctly journalistic style, this history will find its field among uncritical readers. To the trained student of military history the value of this work will be minimized by the entire lack of an Index, of any citation of authority for statements made to original sources, and by the somewhat remarkable fact that in a history of the most stupendous series of military operations in all times, there is not a single map!

Chronologically, the book seems to be valid, and the arrangement, together with the so-called "Visualized Charts," serve to afford an easy grasp of the chronology of the War, the account of which is supplemented by bringing the train of international events down to 1921.

To the military student the strategical soundness (?) of the book may be indicated by the author's explanation of Von Kluck's change of direction preceding the First Battle of the Marne. Without a previous word of explanation concerning the basis of German strategy, he concludes his account (on Page 65) of Von Kluck's maneuver by stating. "Von Kluck's jealousy of Von Buelow had prompted him to appropriate the latter's task, so instead of remaining above the Marne he had selfishly blocked the path of Von Buelow's advance."

Russia To-day and To-Morrow. By Paul N. Miliukov. The Macmillan Co. New York. 1922. 5" x 7¾". 392 pp. Price, $2.25.

Students of Russian affairs will recall Professor Miliukov's volume on Bolshevism—perhaps the most comprehensive contribution to this important question. Miliukov, because of the important position he holds in the Constitutional-Democratic Party, the "Cadets," as he calls it, the first of the Russian constitutional parties, his knowledge and experience gained as a diplomat, editor and student, has attracted the attention and won the confidence of that portion of the reading public who are conscientiously trying to understand what is really happening in Russia.

In his volume on Bolshevism, he gave warning of the grave dangers of Bolshevism; in his work on Russia To-Day and To-Morrow, he concludes his chapter on Bolshevism, its failure—not in a spirit of hatred or revenge for those who have wrought such havoc in his country, committed such damnable crimes in the name of the "dictatorship of the proletariat," but in the clear, concise, dispassionate way of the student of human institutions. Further, he paints his vision of the

Russia of tomorrow, his concluding words in the chapter on this subject being: "Russia is ripe for a democratic change. The change will come. What will emerge from it will be—not the ancient regime, not anarchy, but a great democratic Russia of tomorrow."

Woman and the New Race. By Margaret Sanger. Brentanos, New York. 1922. 5" x 7¾". 234 pp. Cloth.

Mrs Sanger, in her arguments advocating birth control, paints a picture of conditions among the poorer classes of all nations, which is so vivid and so lurid, that even the most hypocritical male reader would be compelled to admit that there is unquestionably something wrong with our legal attitude towards family limitation.

Instead of being tragic or hysterical and therby weakening her arguments, the autheress very wisely evades the criticism of femanine bias, by giving many quotations, statistics, and generally admitted truths, all of which she marshals into a conclusion which is convincing to the most skeptic.

Accepting the statistics and facts, which is the reader's only alternative, we are confronted with the startling information that family limitation exists today through recourse to a surgeon's operating table in the cases of between one and two million women annually. If this end is accomplished, law or no law, at such a terrible risk of health and even life, does not the logical masculine mind instantly decide that the remedy for this condition is legally recognized contraceptives?

Still more logic confronts us; if the birth rate of a country is limited, there will be no such thing as over population, and the necessity for more territory. more food supply and more work will cease to exist, with the result that the chief cause for wars will be removed and the breeding of cannon fodder will be no longer necessary.

Another plea for birth control which appeals to the analyst is that it removes the fear of supremacy of any one nation, assures the ability of all nations to live within their own resources, and overcomes national rivalry, with the result that Peace Conferences and Leagues of Nations are wholly superfluous.

All in all Mrs. Sanger's book is logical and convincing, the ideas expounded are practical and constructive. It is indeed a book to be read by every man and woman who can read.

MISCELLANEOUS SUBJECTS

The Law of Naval Warfare. By Lieutenant Commander J. A. Hall, R. N. V. R Chapman and Hall, Ltd. London. 1921. 5½" x 9". 398 pp. Price, 30s net.

Mr. Hall outlines at great length and in detail the whole of the phases of the naval side of the war, showing what is permissible and emphasising what is illegal under international law. His prime object is the instruction of naval officers, but the book will be of unquestionable value to lawyers and public men. The title page contains an implied tribute to the American viewpoint whereas the contents of the book, though endeavoring to be impartial, values above all things, British historic precedents and prize court decisions.